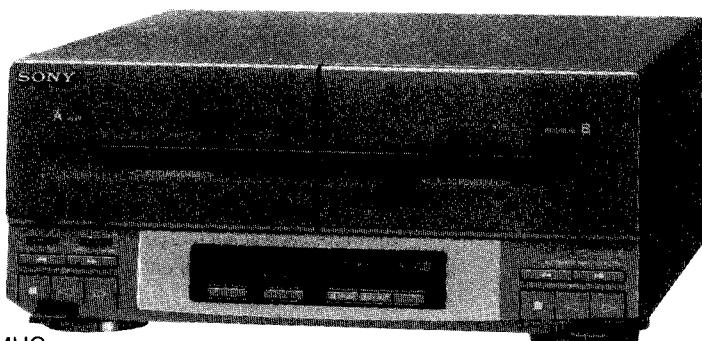


TC-EX90/EX100

SERVICE MANUAL

AEP Model
UK Model
E Model



TC-EX90 is the deck section in MHC-EX50/EX90, and TC-EX100 is the deck section in MHC-EX70AV/EX100AV.

Photo : TC-EX100 (SILVER)

Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.

"DOLBY" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

Model Name Using Similar Mechanism		TC-EX5
Tape Transport	DECK-A	TCM-190RA12CL
Mechanism Type	DECK-B	TCM-190RB52C

SPECIFICATIONS

Recording system	4-track 2-channel stereo
Frequency response	(DOLBY NR OFF) 40 – 13,000 Hz (± 3 dB), using Sony TYPE I cassette
	40 – 14,000 Hz (± 3 dB), using Sony TYPE II cassette
	40 – 15,000 Hz (± 3 dB), using Sony TYPE IV cassette
Wow and flutter	0.1% WRMS $\pm 0.3\%$ (DIN)
Dimensions	Approx. 280 x 122.5 x 280 mm (11 1/8 x 4 7/8 x 11 1/8 in) (w/h/d) incl. projecting parts and controls
Mass	Approx. 2.8 kg (6 lb 2 oz)

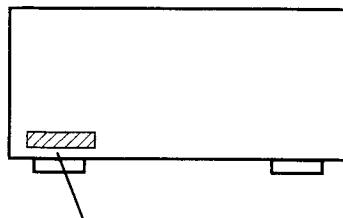


MC-Service

STEREO CASSETTE DECK
SONY[®]

MODEL IDENTIFICATION

— BACK PANEL —



TC-EX100 (AEP, UK Model)	:	4-978-260-0□
TC-EX100 (E Model)	:	4-978-260-1□
TC-EX100 (Saudi Arabia Model)	:	4-978-260-2□
TC-EX100 (Thailand Model)	:	4-978-260-3□
TC-EX90 (AEP, UK Model)	:	4-978-260-4□
TC-EX90 (E Model)	:	4-978-260-5□
TC-EX90 (Saudi Arabia Model)	:	4-978-260-6□
TC-EX90 (Thailand Model)	:	4-978-260-7□

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
SECTION 1. SERVICE NOTE		3
SECTION 2. GENERAL		4
SECTION 3. DISASSEMBLY		
3-1. Case and Back Panel		5
3-2. TC Main Board		5
3-3. Front Panel ASSY		6
3-4. TC Mechanism Deck		6
SECTION 4. ADJUSTMENTS		
4-1. Mechanical Adjustments		7
4-2. Electrical Adjustments		7
Test Mode		7
Record/Playback Head Azimuth Adjustment [Deck-A] [Deck-B]		7
Tape Speed Adjustment [Deck-A] [Deck-B]		8
Playback Level Adjustment [Deck-A] [Deck-B]		8
Record Bias Adjustment [Deck-B]		9
Record Level Adjustment [Deck-B]		9
SECTION 5. DIAGRAMS		
5-1. IC Pin Function		
• IC104 M38123M4-118FP System Controller (TC Main Board)		10
5-2. Circuit Boards Location		12
5-3. Printed Wiring Board — Audio Section —		13
5-4. Schematic Diagram — Audio Section —		15
5-5. Printed Wiring Board — TC Section —		17
5-6. Schematic Diagram — TC Section —		19
5-7. IC Block Diagrams		23
SECTION 6. EXPLODED VIEWS		
6-1. Chassis Section		24
6-2. Front Panel Section		25
6-3. Mechanism Section-1 (Deck A : TCM-190RA12CL) (Deck B : TCM-190RB52C)		26
6-4. Mechanism Section-2 (Deck A : TCM-190RA12CL) (Deck B : TCM-190RB52C)		27
SECTION 7. ELECTRICAL PARTS LIST 28		

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY MARK Δ OR DOTTED LINE WITH MARK Δ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SECTION 1

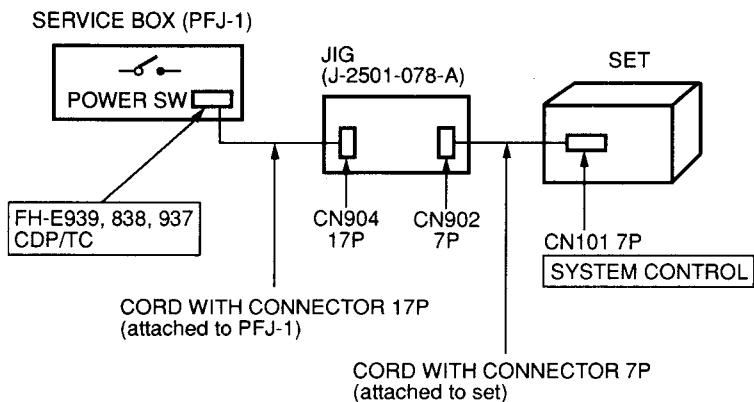
SERVICING NOTE

How to operate with a single unit.

Normally, this set is not operated with its own.

The exclusive jig (J-2501-078-A) and service box (PFJ-1) are necessary to operate the set with a single unit.

Turn the power set of the service box ON. Then press the ■ button of both DECK A and DECK B at the same time to turn the power on.



[Tune light on all LED]

Push ■ button of DECK A and ○ REC MUTE button at the same time. then, all segments of LED turn on the light.
To cancel the mode, push ■ button of DECK A and ○ REC MUTE button at the same time again.

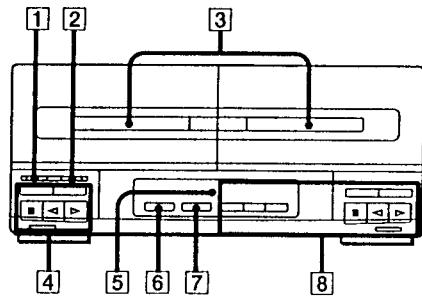
SECTION 2

GENERAL

This section is extracted
from instruction manual.

Index to Parts and Controls

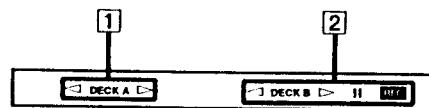
Front Panel



- [1] DOLBY NR selector (15)
- [2] DIRECTION MODE selector (14)
- [3] Cassette compartments (14)
- [4] Tape operating buttons (for deck A)
 - ▷ (front side play) (14)
 - ◁ (reverse side play) (14)
 - (stop) (14)
 - ▶▶ (fast rightward and AMS**) (14)
 - ◀◀ (fast leftward and AMS**) (14)
 - △ (eject) (14)
- [5] Display window
- [6] CD SYNC button (15)
- [7] DUBBING MODE button (19)
- [8] Tape operating buttons (for deck B)
 - ▷ (front side play) (14)
 - ◁ (reverse side play) (14)
 - (stop) (14)
 - ▶▶ (fast rightward and AMS**) (14)
 - ◀◀ (fast leftward and AMS**) (14)
 - PAUSE (14)
 - REC MUTE (16)
 - REC (recording) (16)
 - △ (eject) (14)

**AMS: Automatic Music Sensor (14)

Display Window



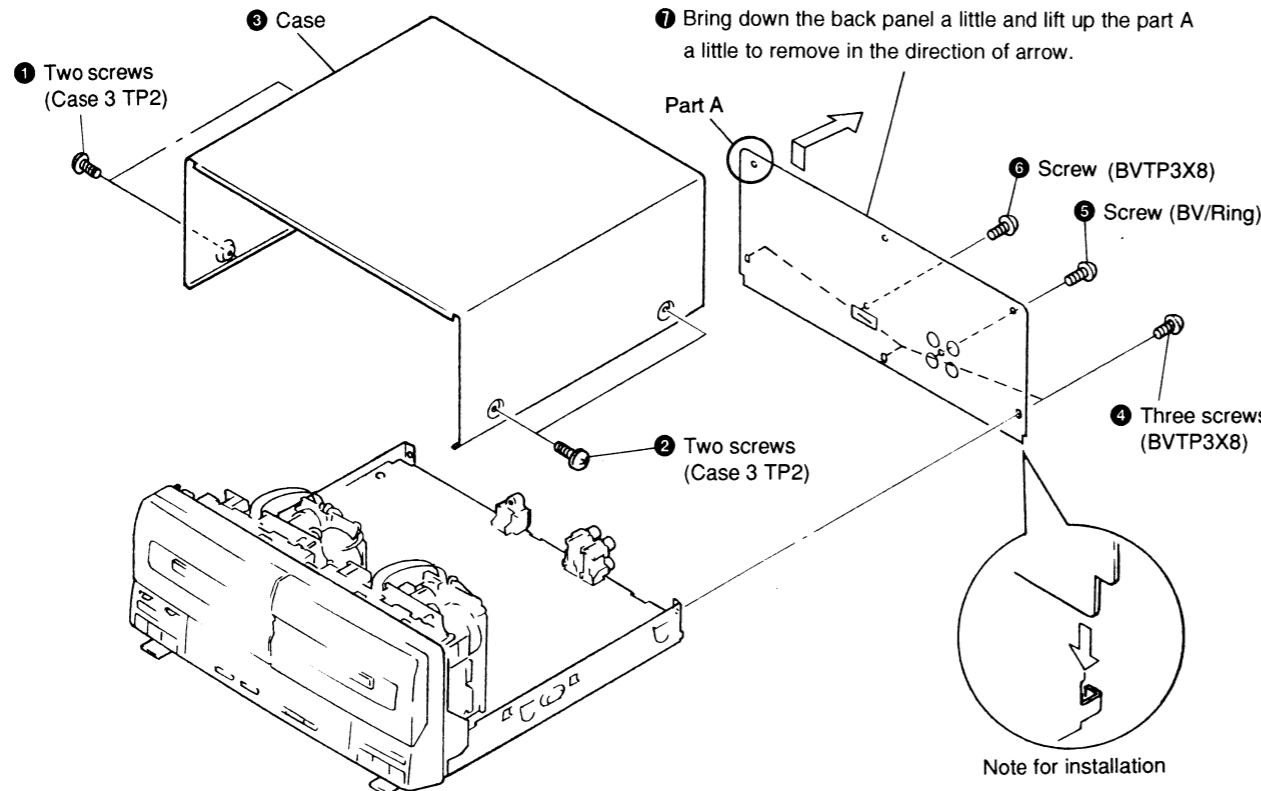
- [1] Deck A status indication
- [2] Deck B status indication

MC-Service

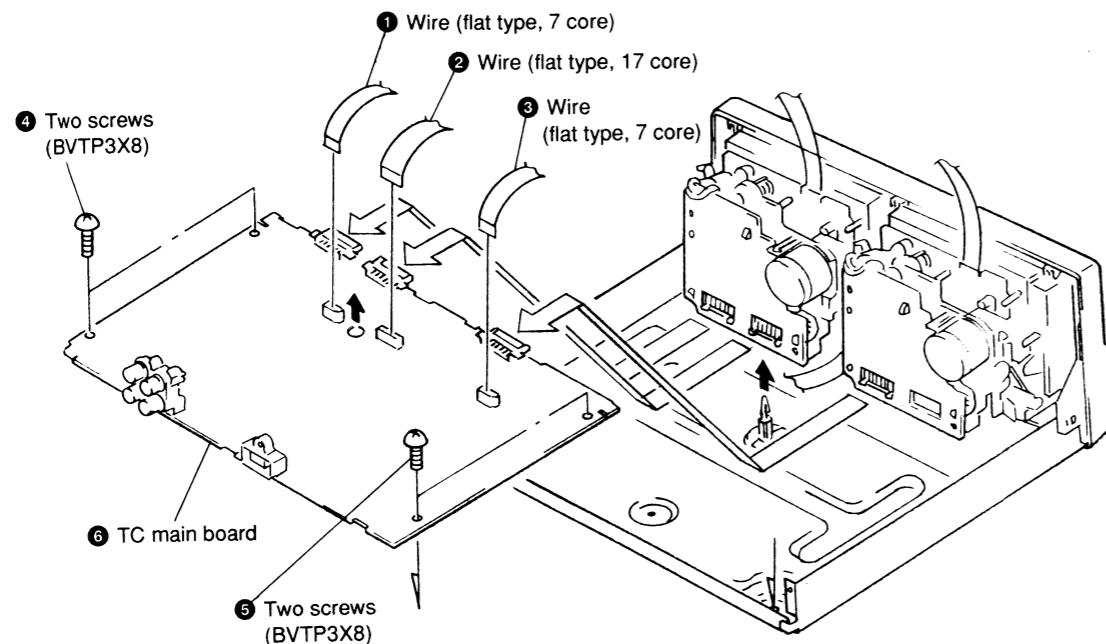
SECTION 3 DISASSEMBLY

Note : Follow the disassembly procedure in the numerical order given.

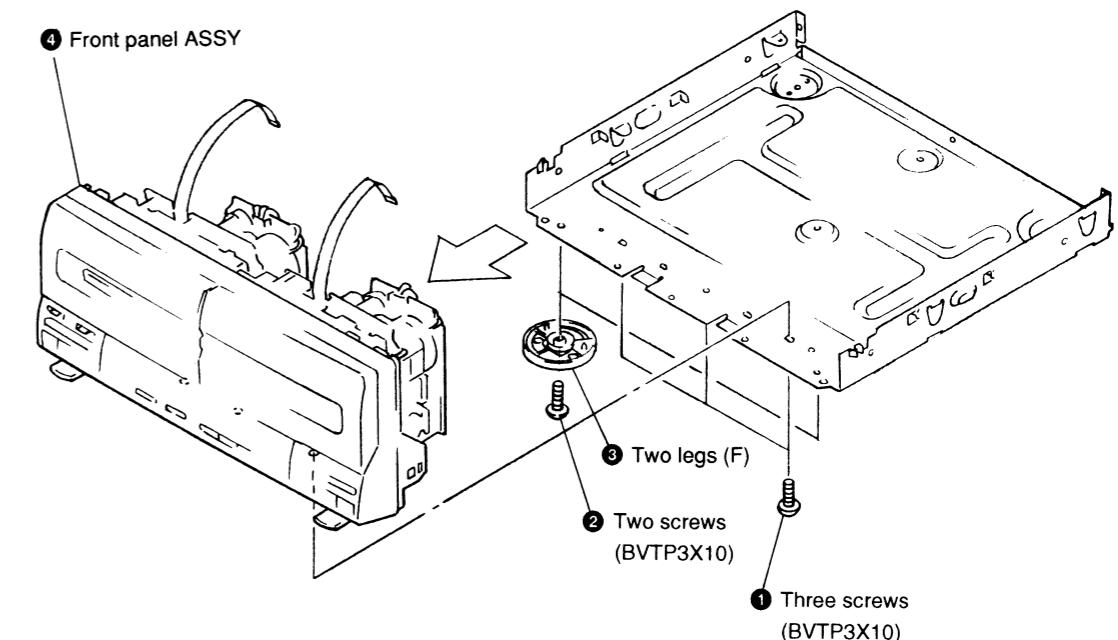
3-1. CASE AND BACK PANEL



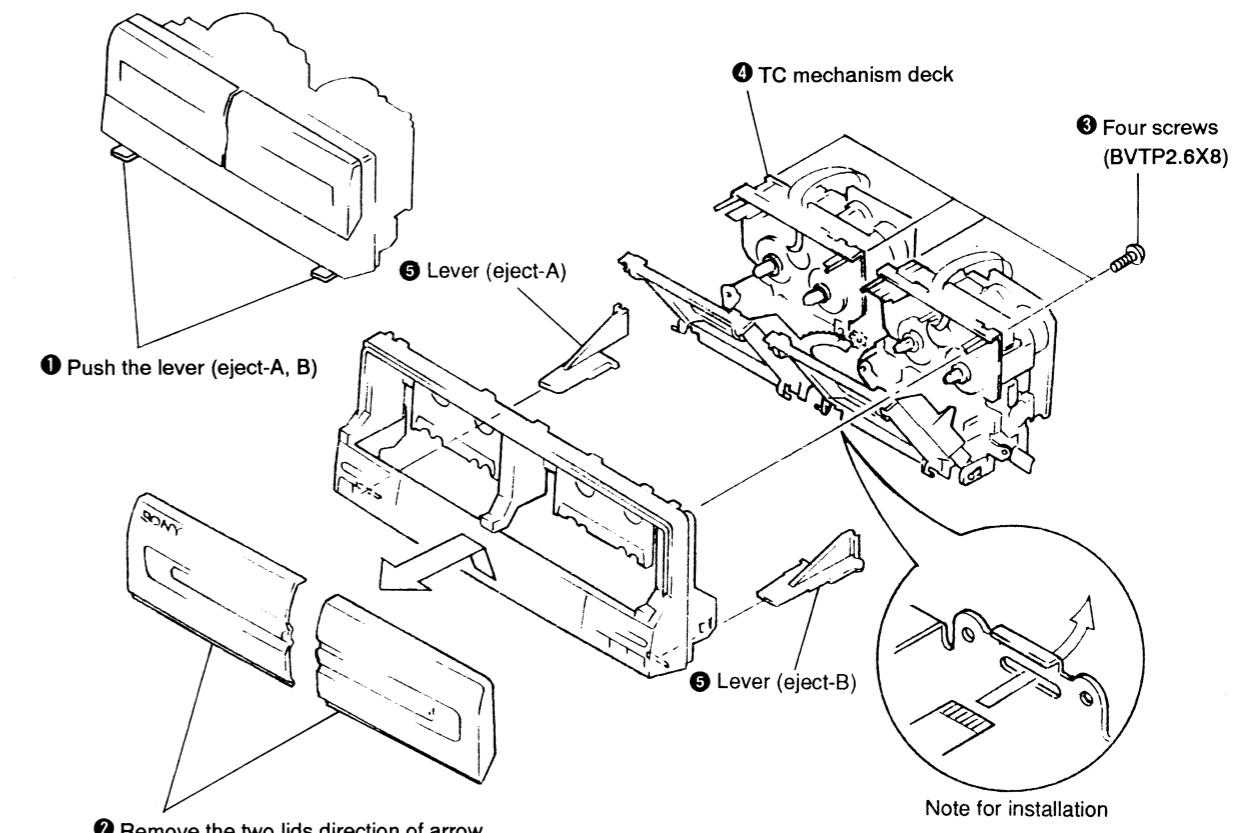
3-2. TC MAIN BOARD



3-3. FRONT PANEL ASSY



3-4. TC MECHANISM DECK

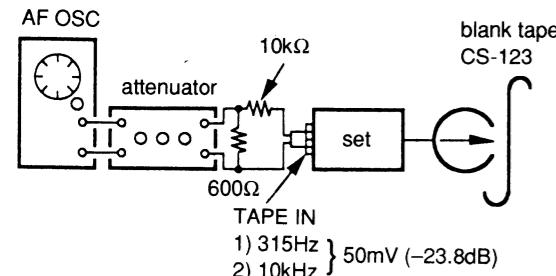


SECTION 5 DIAGRAMS

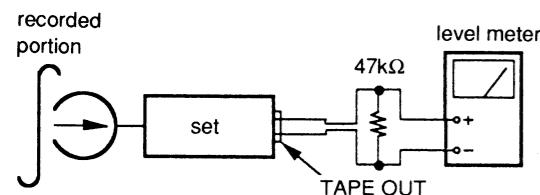
Record Bias Adjustment [DECK-B]

Procedure :

- Mode : Record



- Mode : Playback

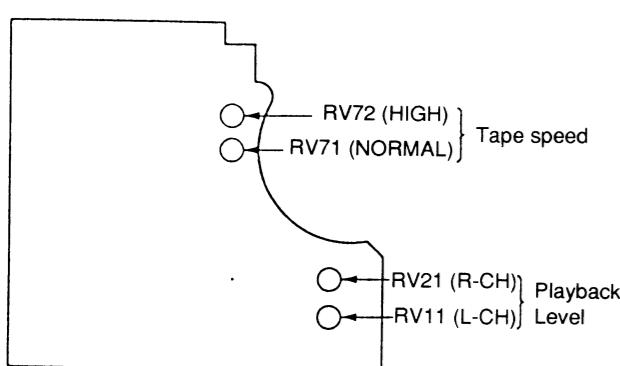


Confirm that the 10 kHz playback output is 0 ± 0.5 dB relative to the 315 Hz output. If necessary, adjust RV12 (L-CH), RV22 (R-CH) and repeat the steps given above.

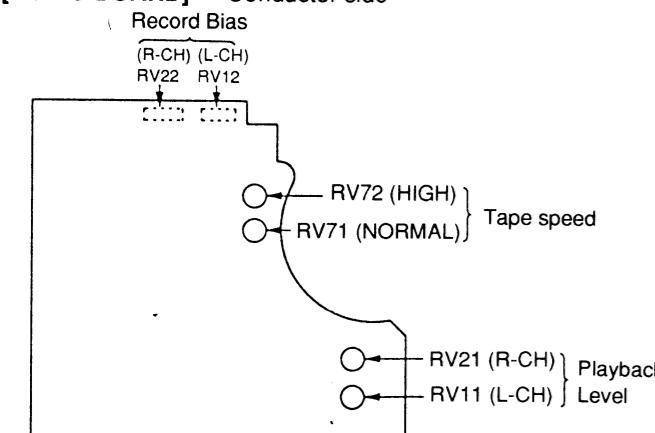
Adjustment Location : AUDIO board. (See page 9)

— Adjustment Parts Location Diagrams —

DECK A :
[MAIN BOARD] — Conductor side —



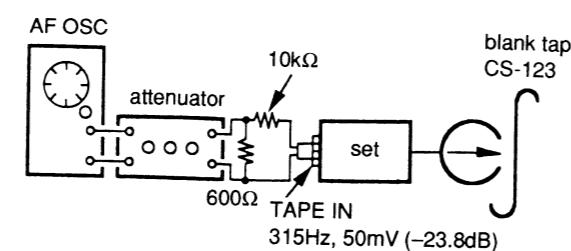
DECK B :
[AUDIO BOARD] — Conductor side —



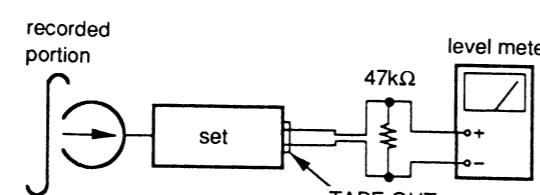
Record Level Adjustment [DECK-B]

Procedure :

- Mode : Record



- Mode : Playback



Confirm playback the tape recorded become adjustment level as follows.

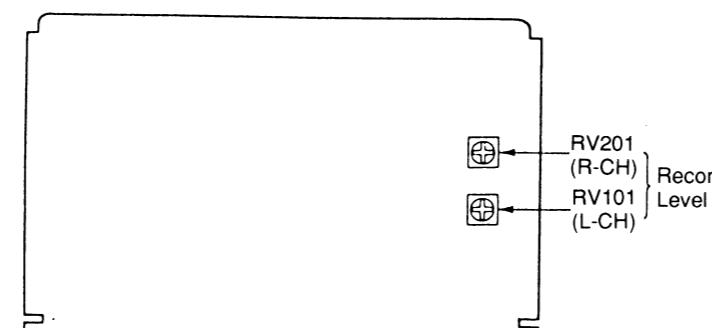
If necessary, adjust RV101 (L-CH), RV201 (R-CH) and repeat the steps 1 and 2.

Adjustment level :

TAPE OUT level : -23.8 ± 0.5 dB (47.2 to 53 mV)

Adjustment Location : TC MAIN board. (See page 9)

[TC MAIN BOARD] — Component side —



5-1. IC PIN FUNCTION

• IC104 M38123M4-118FP SYSTEM CONTROL (TC MAIN BOARD)

Pin No.	Pin Name	I/O	Function
1	B HALF	I	B Half detection input. "L": Presence "H": Nothing
2	KEY 3	I	
3	KEY 2	I	
4	KEY 1	I	
5	TEST	I	Electrical adjustment test mode setting. "L": Test mode
6	DISP RST	O	
7	DISP SYNC	O	
8	DISP CLK	O	
9	DISP OUT	O	
10	DISP IN	O	
11	B REEL 2	O	
12	B REEL 3	O	
13	B REEL 1	O	
14	A REEL 1	O	
15	A REEL 3	O	
16	A REEL 2	O	
17	PWR IN	I	+5V power supply input.
18	AUB IN	I	Audio bus input.
19	NRST	I	Microcomputer reset input.
20	AUB OUT	O	Audio bus output.
21	XC OUT	O	Not used. (GND)
22	X IN	I	
23	X OUT	O	Oscillator connection pins. (4 MHz)
24	Vss	-	
25	VER	-	
26	PWR OUT	O	Not used. (Open)
27	LINE MUTE	O	Line mute ON/OFF. "L": ON
28	BIAS	O	Bias oscillation control output. "L": ON
29	NC	-	GND
30	DAT FUNC	O	DAT mute output.
31	CD FUNC	O	CD mute output.
32	PASS	O	PASS amplifier switch output to dolby.
33	EQ H/L	O	REC equalizer switching output. "L": High speed "H": Normal speed
34	REC MUTE	O	REC mute output.
35	PB SEL	O	Play mode deck A/B select output. "L": DECK A "H": DECK B
36	AMS G SEL	O	AMS/BS mode select output. "H": AMS mode "L": BS mode
37	1599 MUTE	O	Mute output to IC101 (CXA1599Q). "H": ON "L": OFF
38	NC	-	Not used. (+5V)
39	NR RELAY	O	ALC (Automatic Level Control) control output.
40	CD SYNC	O	CD synchro dubbing LED output. "H": ON "L": OFF

Pin No.
41
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SECTION 5 DIAGRAMS

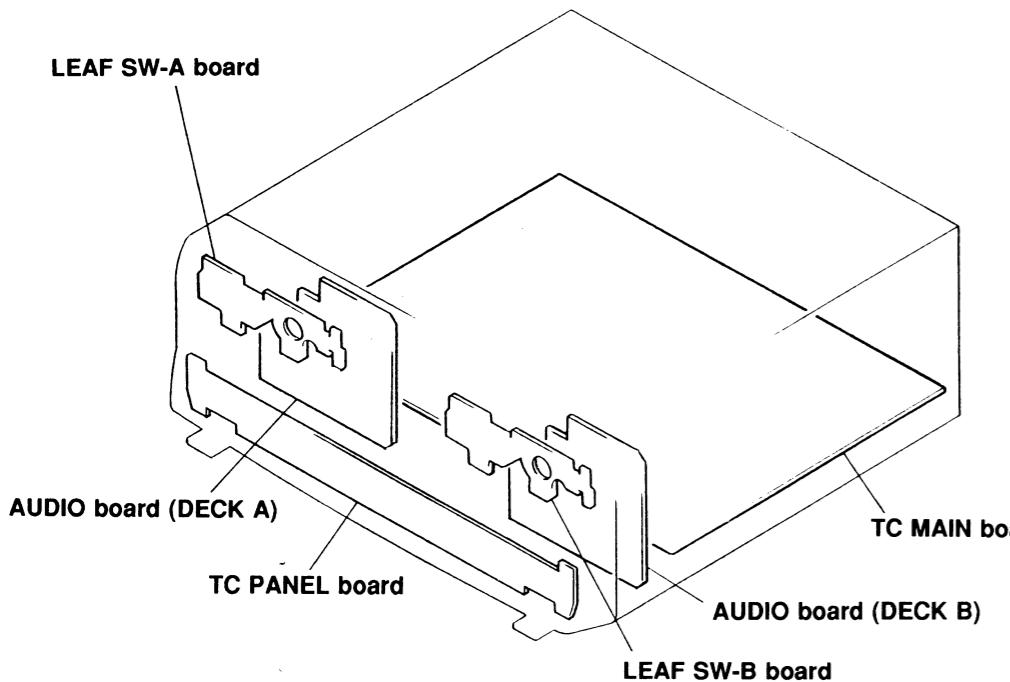
5-1. IC PIN FUNCTION

- IC104 M38123M4-118FP SYSTEM CONTROL (TC MAIN BOARD)

Pin No.	Pin Name	I/O	Function
1	B HALF	I	B Half detection input. "L": Presence "H": Nothing
2	KEY 3	I	
3	KEY 2	I	Key input. (A/D converter analog input)
4	KEY 1	I	
5	TEST	I	Electrical adjustment test mode setting. "L": Test mode
6	DISP RST	O	
7	DISP SYNC	O	GND
8	DISP CLK	O	
9	DISP OUT	O	
10	DISP IN	O	
11	B REEL 2	O	Deck B reel motor control output.
12	B REEL 3	O	
13	B REEL 1	O	
14	A REEL 1	O	Deck A reel motor control output.
15	A REEL 3	O	
16	A REEL 2	O	
17	PWR IN	I	+5V power supply input.
18	AUB IN	I	Audio bus input.
19	NRST	I	Microcomputer reset input.
20	AUB OUT	O	Audio bus output.
21	XC OUT	O	Not used. (GND)
22	X IN	I	Oscillator connection pins. (4 MHz)
23	X OUT	O	
24	Vss	-	GND
25	VER	-	
26	PWR OUT	O	Not used. (Open)
27	LINE MUTE	O	Line mute ON/OFF. "L": ON
28	BIAS	O	Bias oscillation control output. "L": ON
29	NC	-	GND
30	DAT FUNC	O	DAT mute output.
31	CD FUNC	O	CD mute output.
32	PASS	O	PASS amplifier switch output to dolby.
33	EQ H/L	O	REC equalizer switching output. "L": High speed "H": Normal speed
34	REC MUTE	O	REC mute output.
35	PB SEL	O	Play mode deck A/B select output. "L": DECK A "H": DECK B
36	AMS G SEL	O	AMS/BS mode select output. "H": AMS mode "L": BS mode
37	1599 MUTE	O	Mute output to IC101 (CXA1599Q). "H": ON "L": OFF
38	NC	-	Not used. (+5V)
39	NR RELAY	O	ALC (Automatic Level Control) control output.
40	CD SYNC	O	CD synchro dubbing LED output. "H": ON "L": OFF

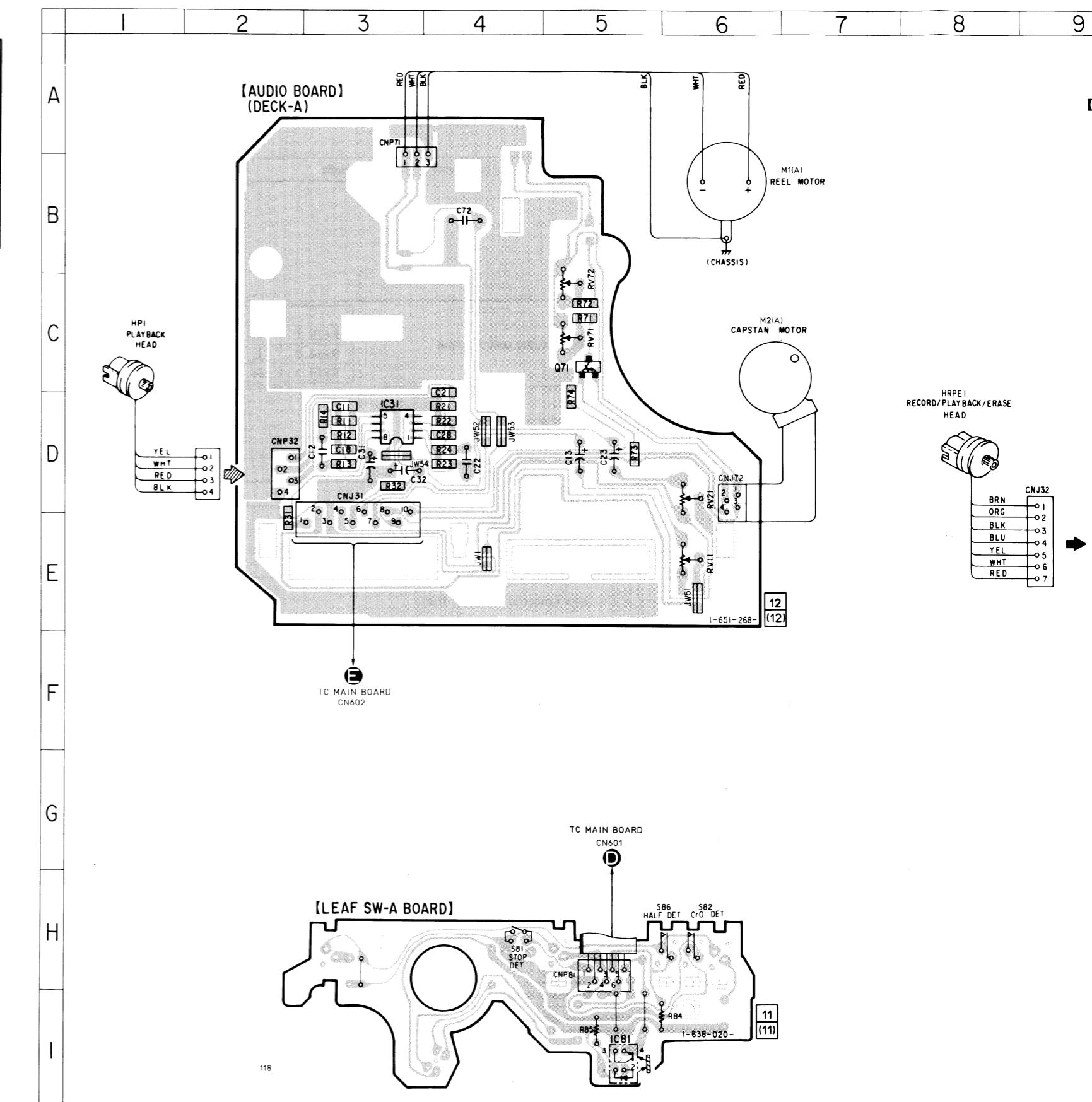
Pin No.	Pin Name	I/O	Function
41	DUB H	O	High speed dubbing LED output. "H": ON "L": OFF
42	DUB N	O	Normal speed dubbing LED output. "H": ON "L": OFF
43	PAUSE	O	PAUSE LED output. "H": ON "L": OFF
44	REC	O	REC LED output. "H": ON "L": OFF
45	B <	O	Deck B REV LED output. "H": ON "L": OFF
46	B >	O	Deck B FWD LED output. "H": ON "L": OFF
47	A <	O	Deck A REV LED output. "H": ON "L": OFF
48	A >	O	Deck A FWD LED output. "H": ON "L": OFF
49	B STOP SW	I	Deck B stop detect input. "H": STOP
50	A STOP SW	I	Deck A stop detect input. "H": STOP
51	+7.5V DET	I	+7.5V power supply detect input.
52	RELAY	O	Control output to REC/PB select output. "H": REC "L": PLAY
53	REC/PB	O	Dolby IC (IC103) REC/PB select output. "H": REC "L": PLAY
54	CAP. MOT H/L	O	Capstan motor HIGH/LOW select output. "H": HIGH "L": LOW
55	B CAP. MOTOR	O	Deck B capstan motor control output. "H": ON "L": OFF
56	A CAP. MOTOR	O	Deck A capstan motor control output. "H": ON "L": OFF
57	VDD	-	+5V power supply.
58	VEE	-	GND
59	AVss	-	
60	VREF	I	A/D converter reference power supply +5V.
61	A HALF	I	Deck A half detect input.
62	BS. REEL IN	I	Deck B reel table signal input.
63	AS. REEL IN	I	Deck A reel table signal input.
64	AMS IN	I	AMS input. "L": No song "H": Song

5-2. CIRCUIT BOARDS LOCATION

**Note:**

- : parts extracted from the component side.
- : parts extracted from the conductor side.
- : Pattern from the side which enable seeing.

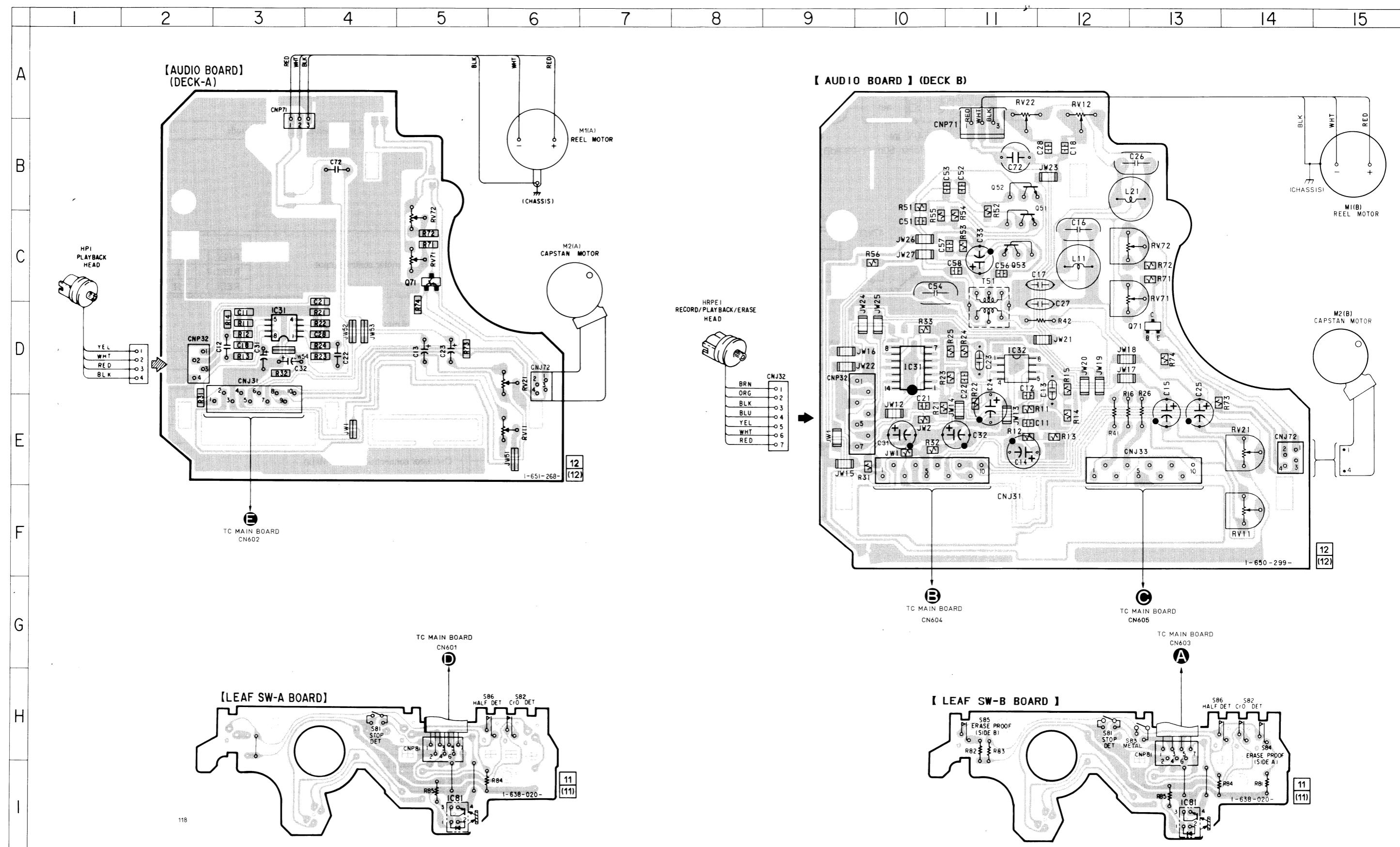
5-3. PRINTED WIRING BOARD — AUDIO SECTION —



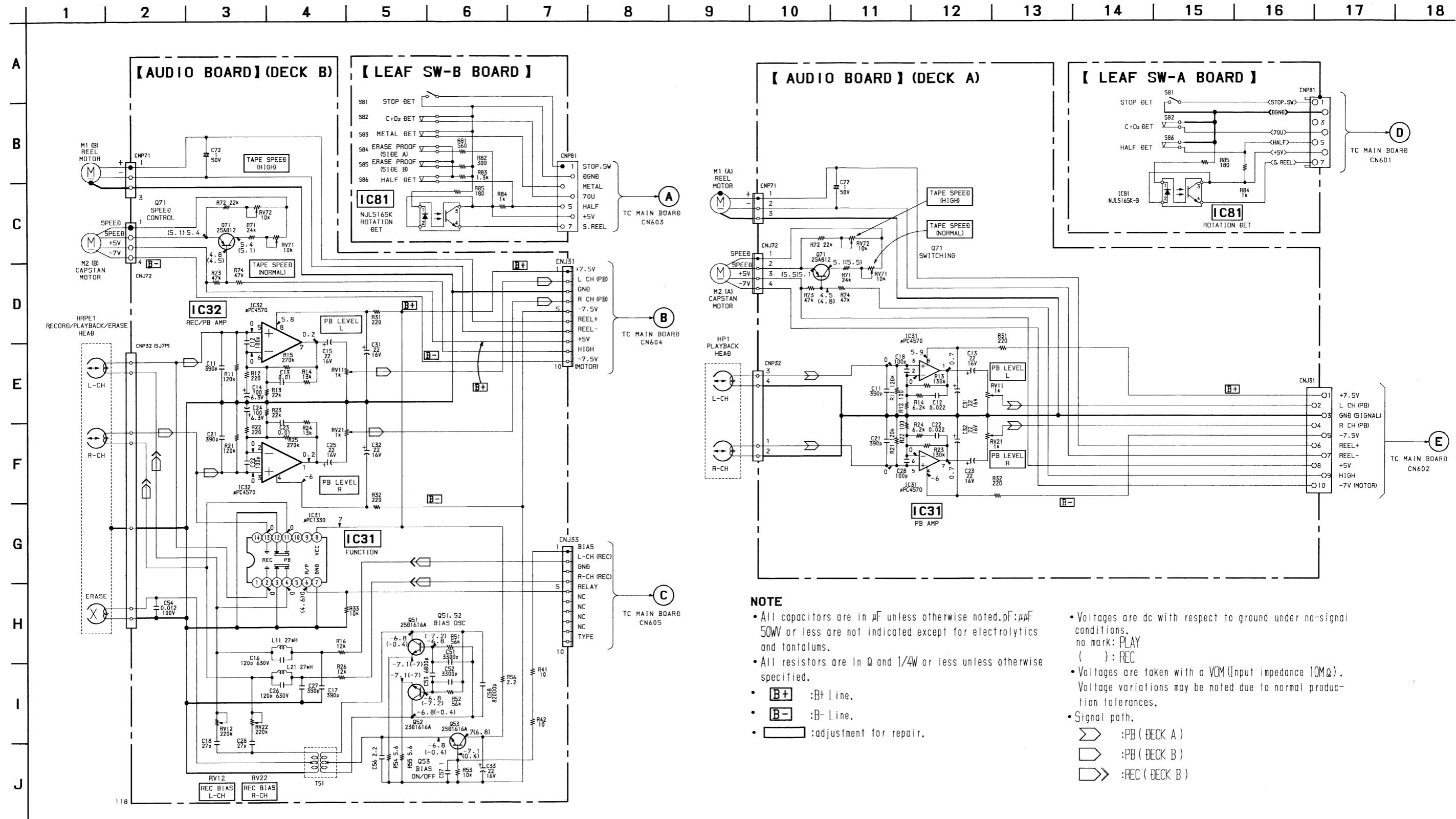
5-3. PRINTED WIRING BOARD — AUDIO SECTION —

conductor
on

No.	Location
CK A)	D-3
CK B)	D-10
CK A)	D-11
CK B)	I-5
CK A)	I-13
CK B)	C-11
CK A)	B-11
CK B)	C-11
CK A)	C-5
CK B)	D-13



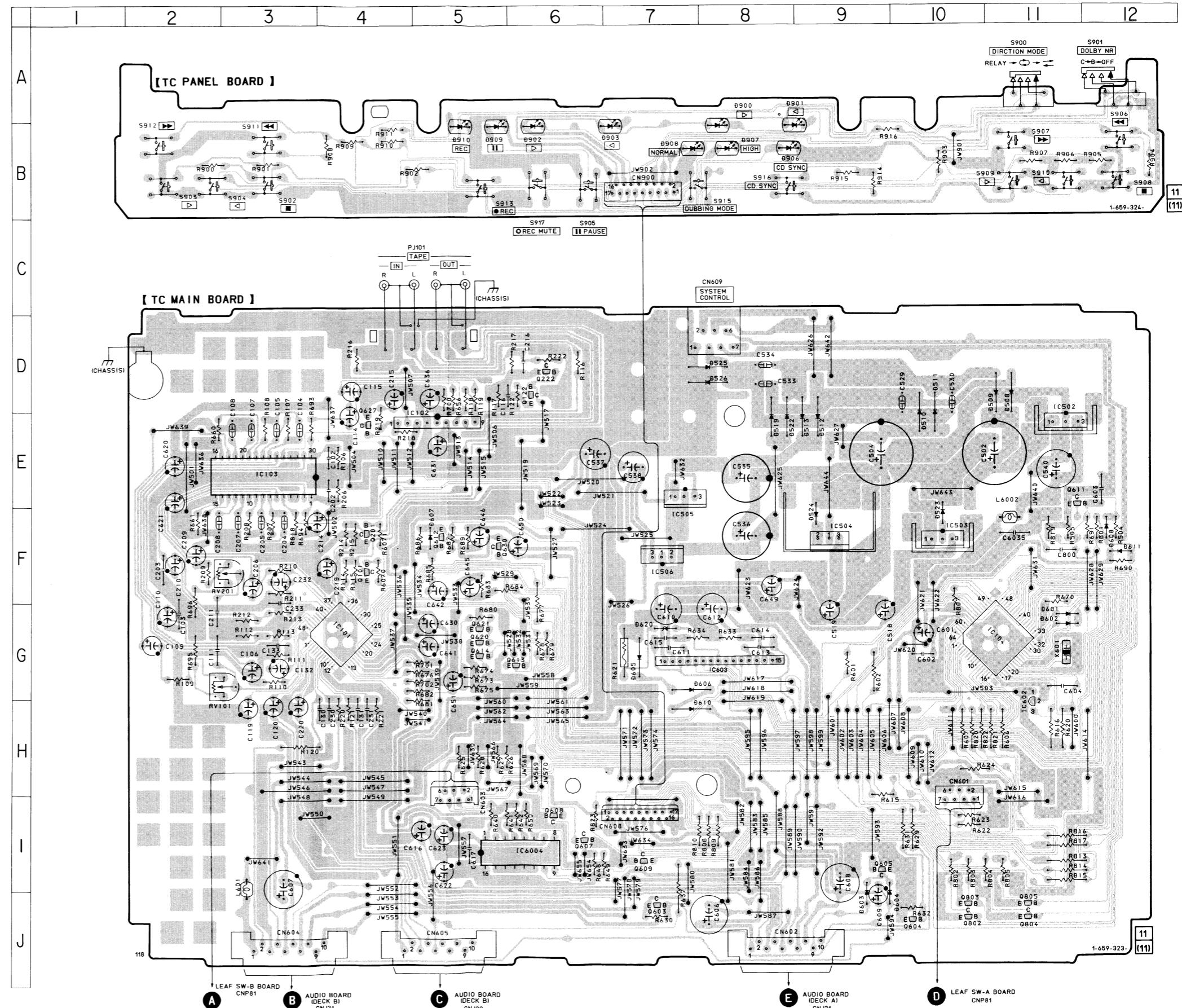
5-4. SCHEMATIC DIAGRAM — AUDIO SECTION —



5-5. PRINTED WIRING BOARD — TC SECTION —
• See page 12 for Circuit Boards Location.

• Semiconductor Location

Ref. No.	Location	Ref. No.	Location
D508	D-11	IC102	E-5
D509	D-11	IC103	E-3
D510	E-10	IC104	G-11
D511	E-10	IC502	E-11
D512	E-9	IC503	F-10
D513	E-9	IC504	F-9
D519	E-8	IC505	E-7
D522	E-8	IC506	F-7
D523	F-10	IC602	H-11
D524	F-9	IC603	G-8
D525	D-8	IC6004	I-6
D526	D-8		
D601	G-11	Q101	F-4
D602	G-11	Q122	D-6
D603	J-9	Q201	F-4
D604	J-9	Q222	D-6
D605	G-7	Q603	J-7
D606	G-7	Q604	J-10
D607	F-5	Q605	I-9
D608	F-12	Q607	I-6
D610	H-7	Q608	I-6
D611	F-12	Q609	I-7
D620	G-7	Q611	F-11
D900	B-8	Q612	F-5
D901	B-8	Q613	G-6
D902	B-6	Q614	G-5
D903	B-7	Q620	G-5
D906	B-8	Q621	G-5
D907	B-8	Q627	E-4
D908	B-7	Q630	F-5
D909	B-5	Q802	J-10
D910	B-5	Q803	J-10
IC101	G-4	Q804	J-11
		Q805	J-11

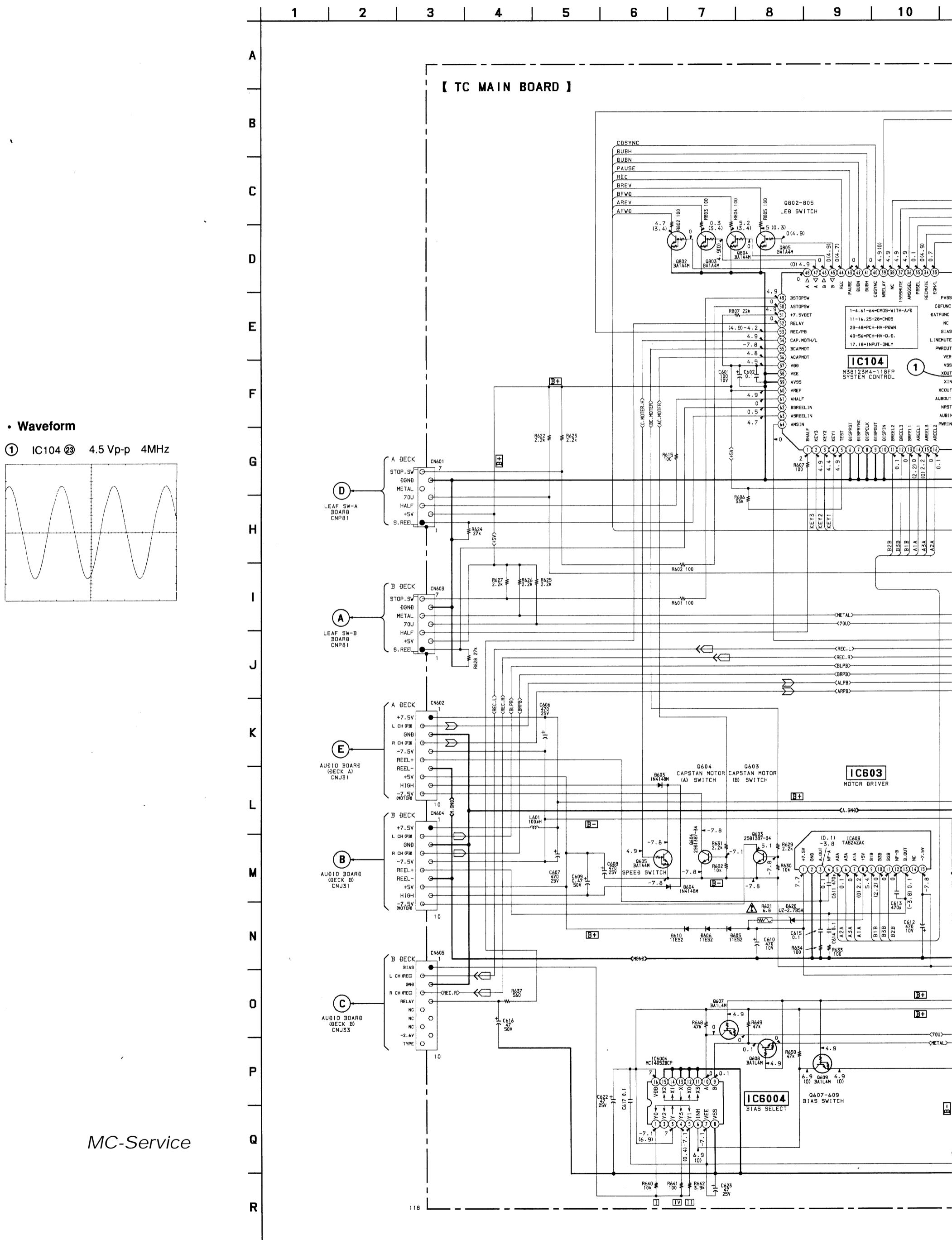


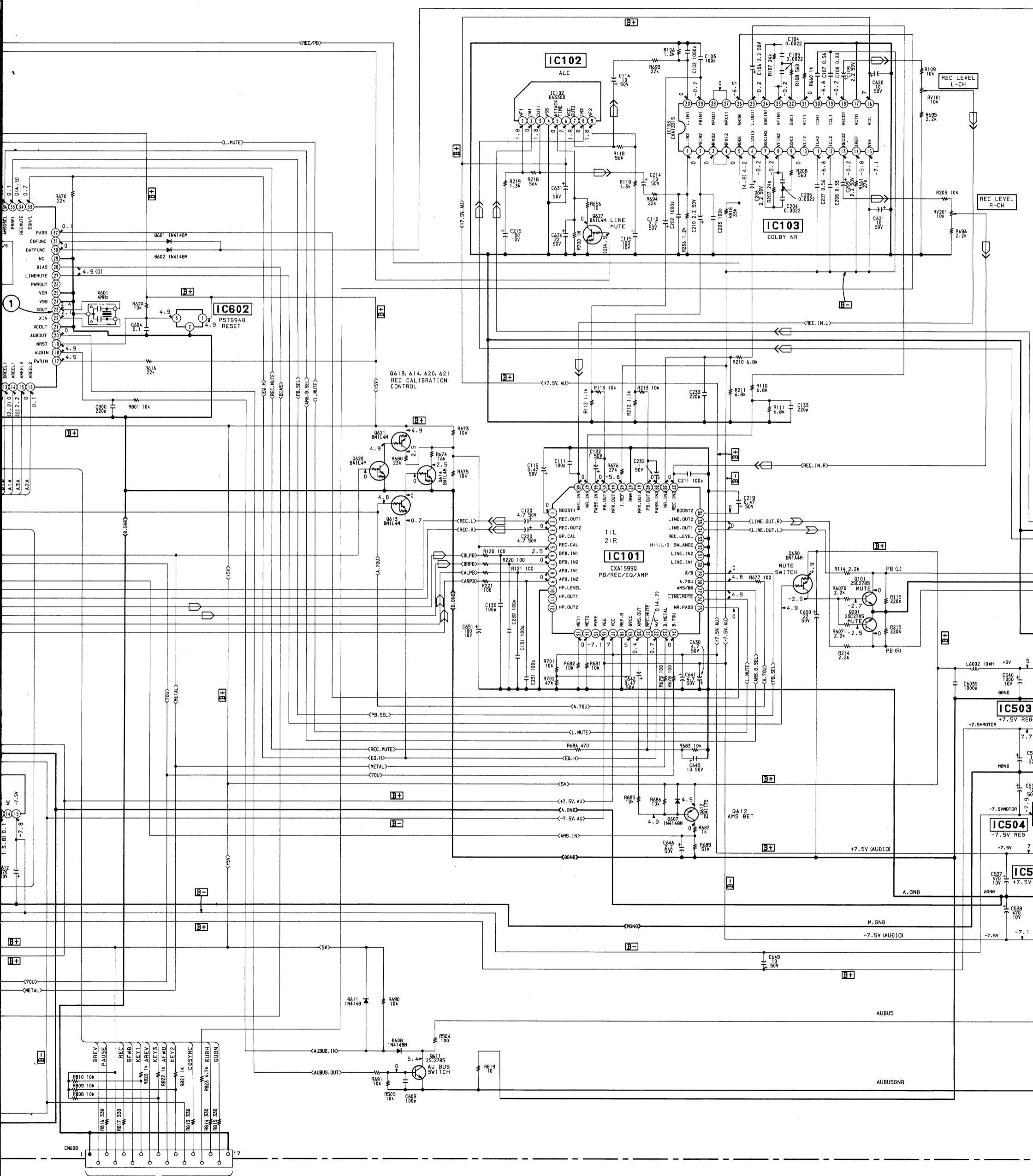
Note:

- ○ : parts extracted from the component side.
- — : parts extracted from the conductor side.
- Δ : internal component.
- ■ : Pattern from the side which enable seeing.

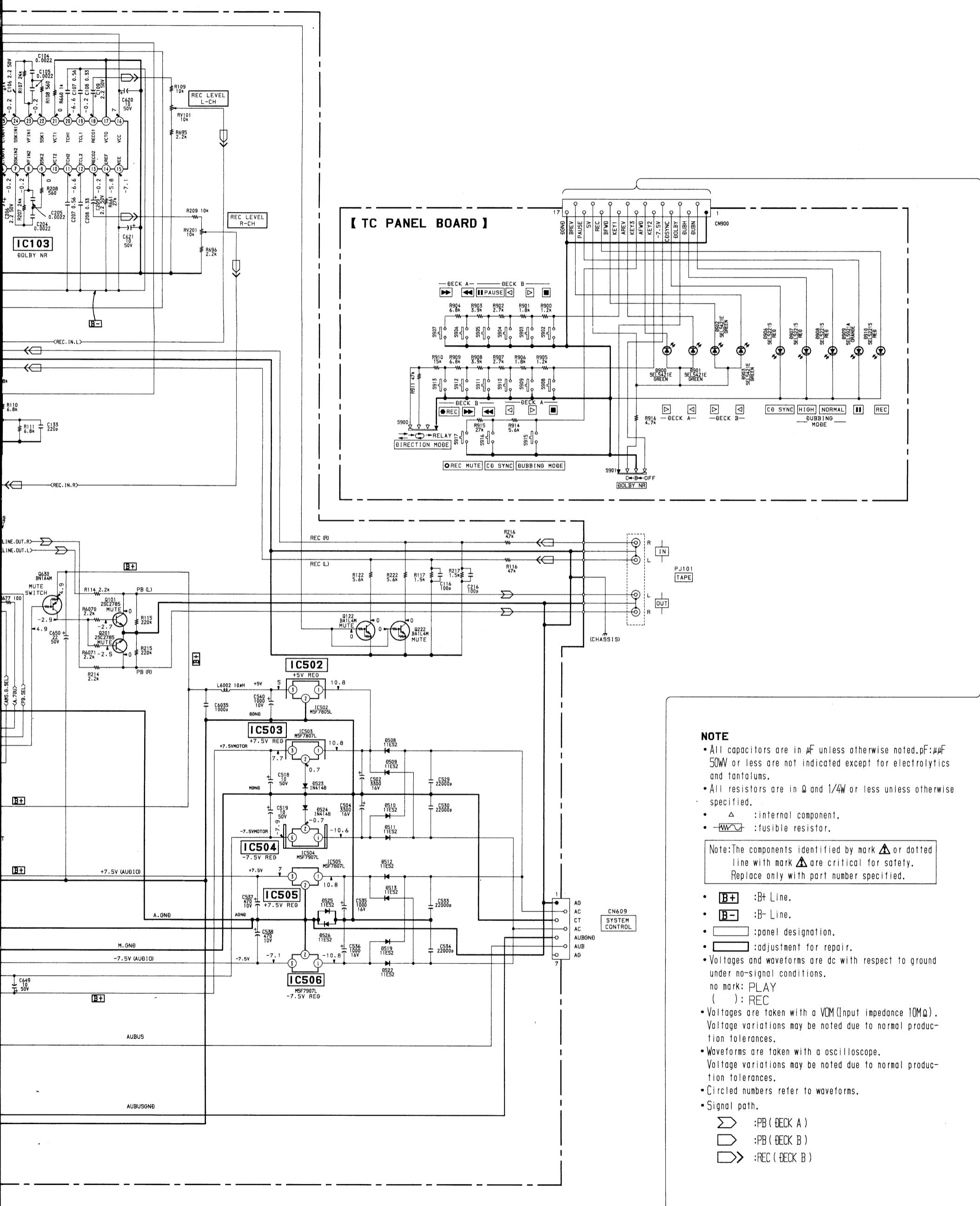
5-6. SCHEMATIC DIAGRAM — TC SECTION —

- See page 10 for IC Pin function. (IC104)
- See page 23 for IC Block Diagrams.



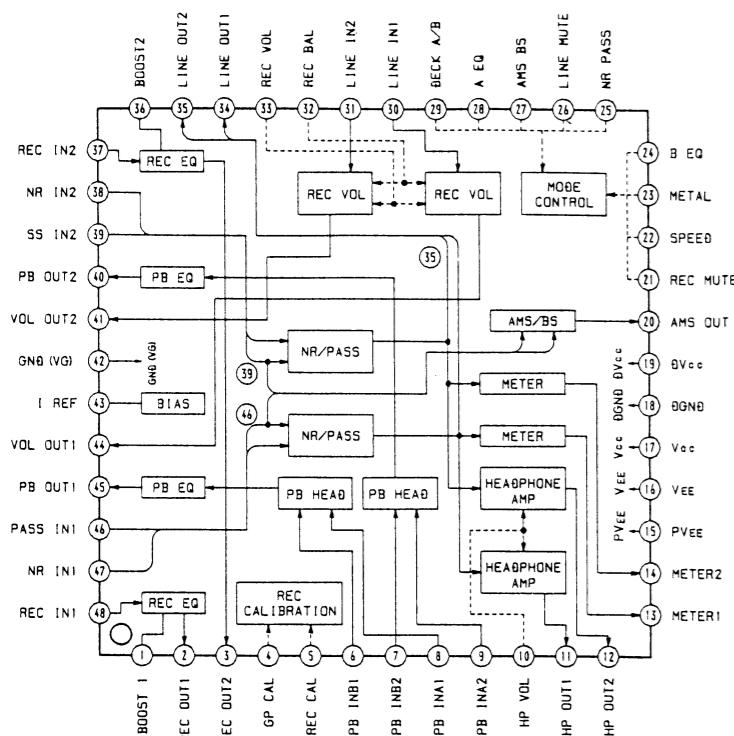


21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34

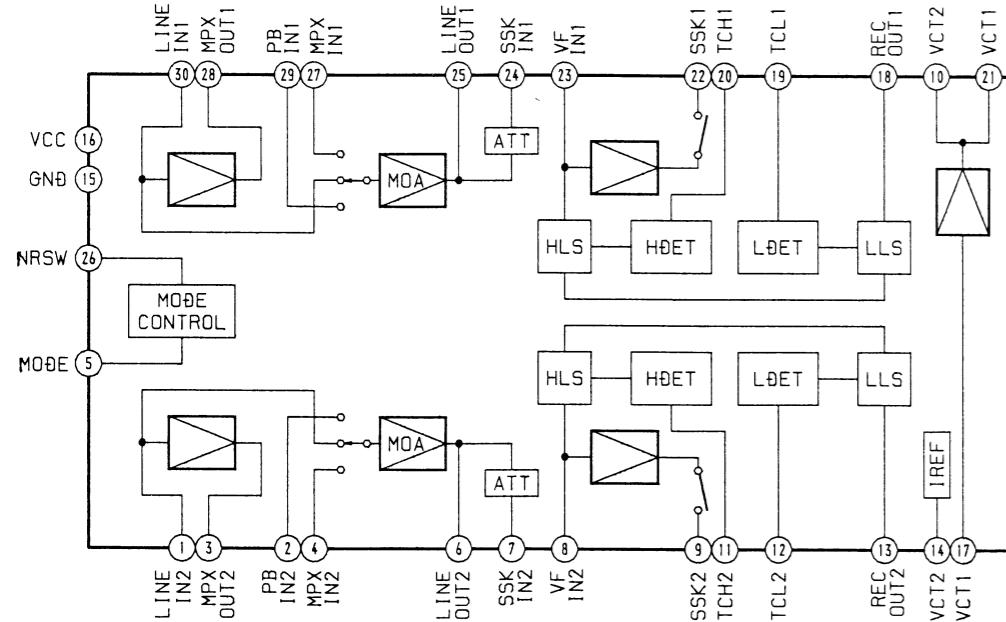


5-7. IC BLOCK DIAGRAMS

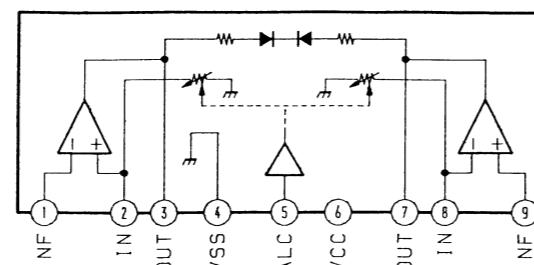
IC101 CXA1599Q



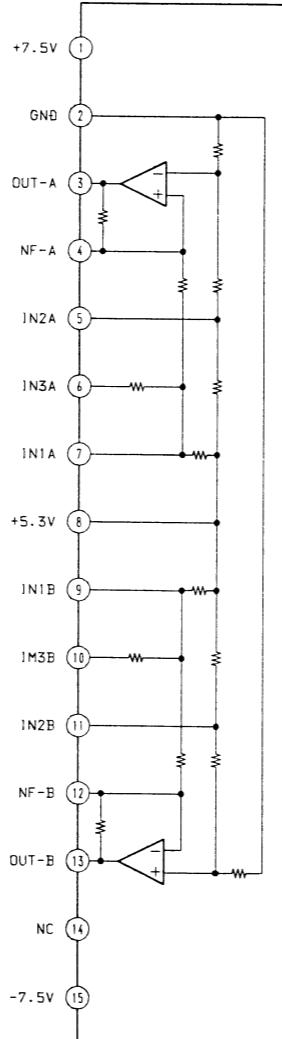
IC103 CXA1331S



IC102 BA3308



IC603 TA8242AK



SECTION 6

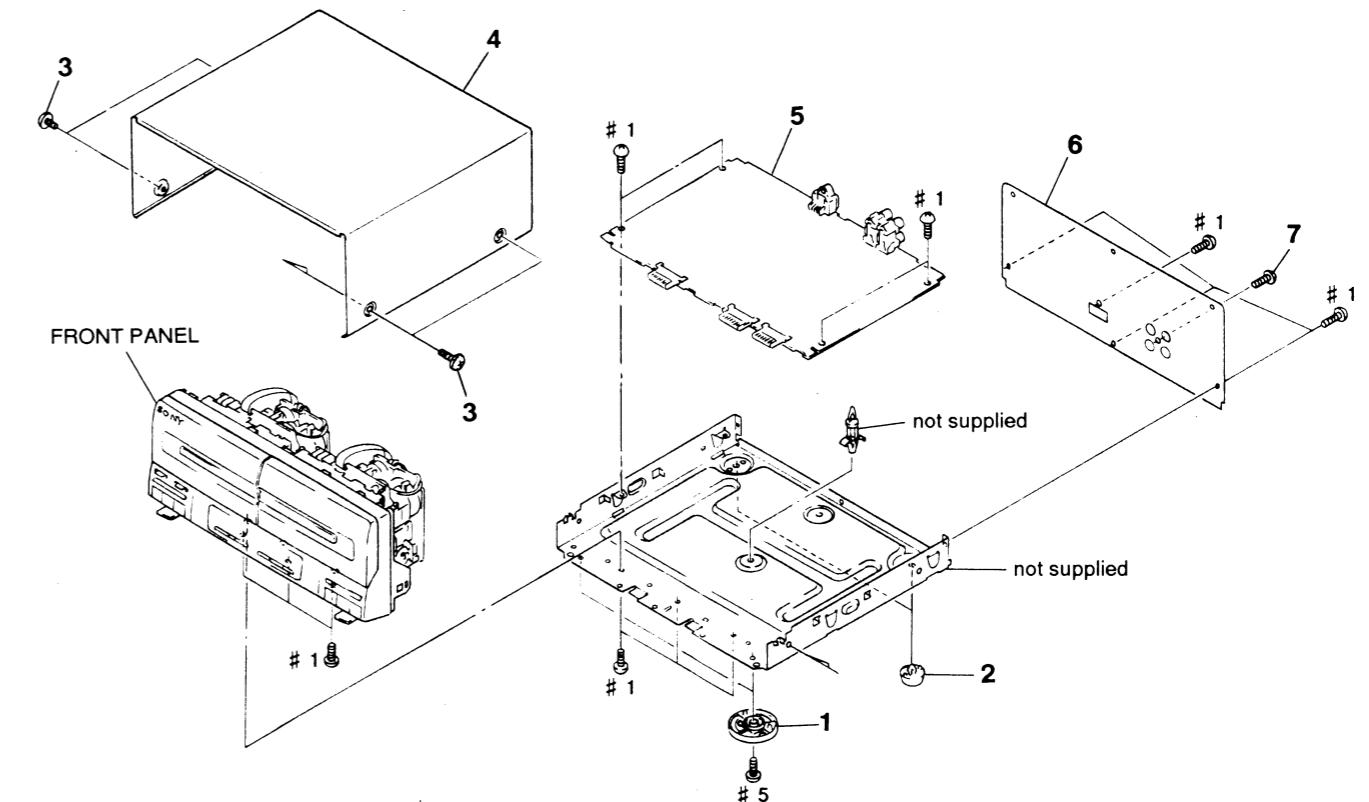
EXPLODED VIEWS

NOTE:

- XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts Example:
KNOB, BALANCE (WHITE) ... (RED)
↑
Parts color Cabinet's color

The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.

6-1. CHASSIS SECTION



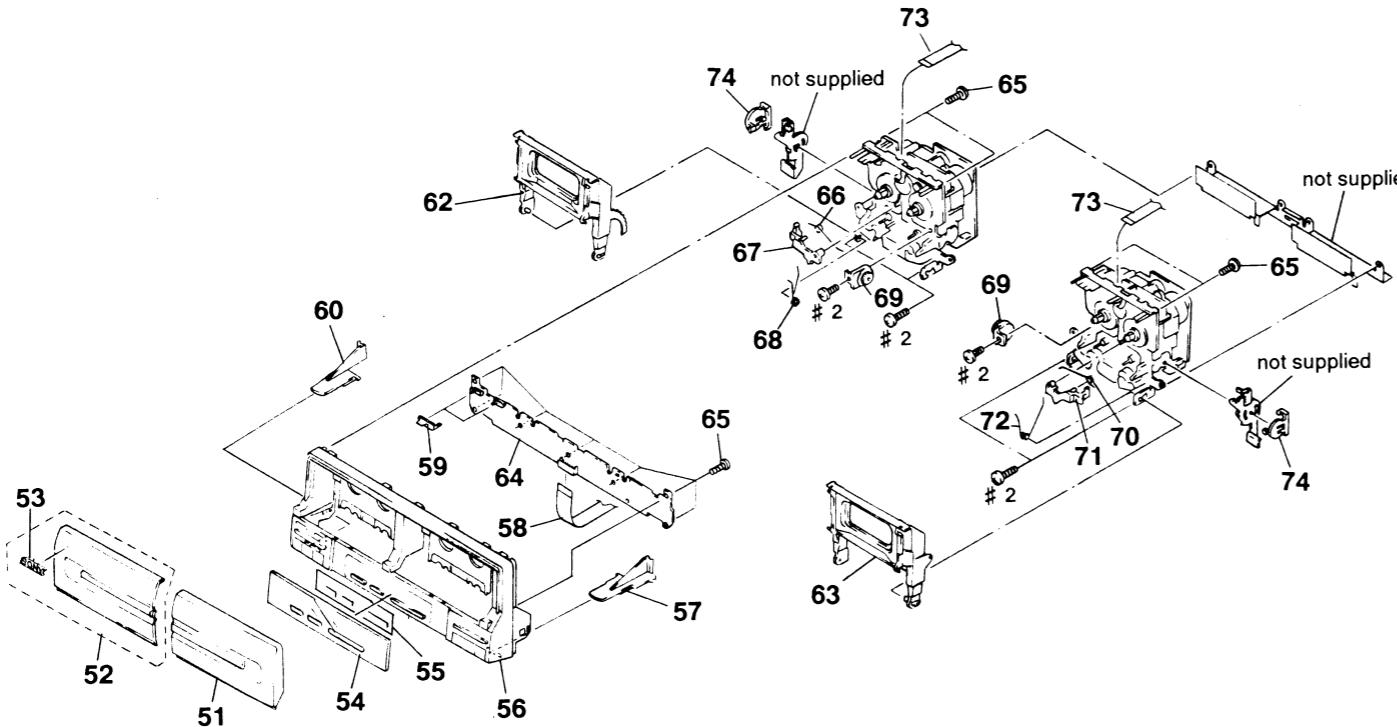
Ref. No.	Part No.	Description
1	4-977-699-11	LEG (F)
2	4-965-822-01	FOOT
3	3-363-099-01	SCREW (CASE 3 TP2)
* 4	4-978-245-51	CASE (SILVER)
* 4	4-978-245-71	CASE (BLACK)
* 5	A-2007-477-A	TC MAIN BOARD, COMPLETE
* 6	4-978-260-01	PANEL, BACK (EX100:AEP, UK)
* 6	4-978-260-11	PANEL, BACK (EX100:E)

Ref. No.	Part No.	Description
* 6	4-978-260-21	PANEL, BACK (EX100:EA)
* 6	4-978-260-31	PANEL, BACK (EX100:TH)
* 6	4-978-260-41	PANEL, BACK (EX90:AEP, UK)
* 6	4-978-260-51	PANEL, BACK (EX90:E)
* 6	4-978-260-61	PANEL, BACK (EX90:EA)
* 6	4-978-260-71	PANEL, BACK (EX90:TH)
7	3-704-515-01	SCREW (BV/RING)

Ref. No.	Part No.	Remark
51	X-3	
51	X-4	
52	X-3	
52	X-4	
53	4-9	
54	X-4	
55	4-9	
56	X-3	
56	X-4	
57	4-9	
57	4-9	
58	1-7	
59	4-9	
59	4-9	
60	4-9	
60	4-9	

6-2. FRONT PANEL SECTION

mark
are
number



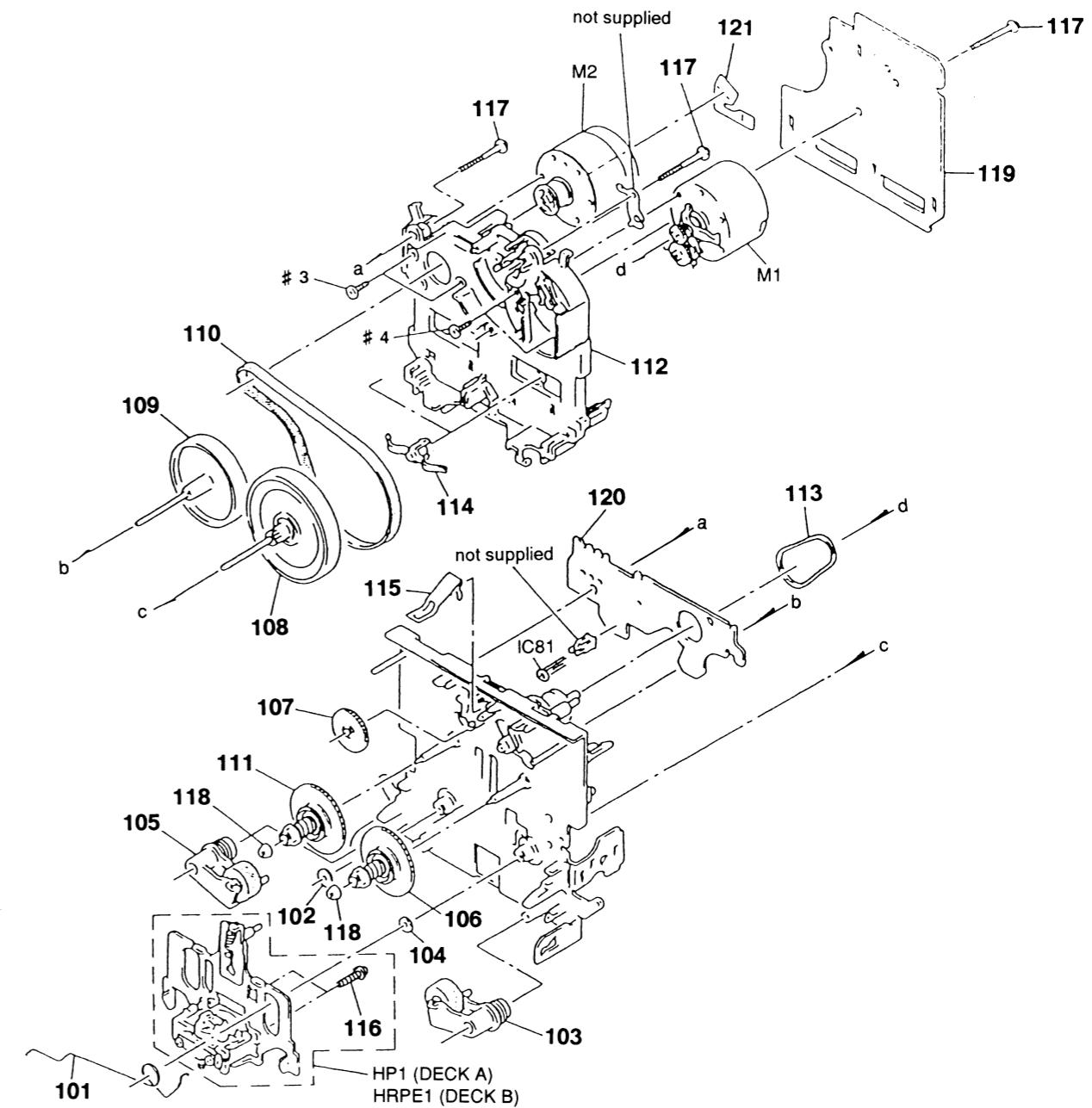
Ref. No. Part No. Description

Ref. No.	Part No.	Description	Remark
51	X-3371-674-1	LID (B) ASSY, CASSETTE (BLACK)	
51	X-4946-613-1	LID (B) ASSY, CASSETTE (SILVER)	
52	X-3371-673-1	LID (A) ASSY, CASSETTE (BLACK)	
52	X-4946-612-1	LID (A) ASSY, CASSETTE (SILVER)	
53	4-962-708-11	EMBLEM (4-A), SONY	
54	X-4947-183-1	WINDOW ASSY	
55	4-978-257-01	ILLUMINATOR	
56	X-3371-672-1	PANEL ASSY, FRONT (BLACK)	
56	X-4946-611-1	PANEL ASSY, FRONT (SILVER)	
57	4-978-255-01	LEVER (EJECT-B) (SILVER)	
57	4-978-255-11	LEVER (EJECT-B) (BLACK)	
58	1-769-390-11	WIRE (FLAT TYPE) (17 CORE)	
59	4-978-256-01	KNOB (SLIDE) (SILVER)	
59	4-978-256-11	KNOB (SLIDE) (BLACK)	
60	4-978-254-01	LEVER (EJECT-A) (SILVER)	
60	4-978-254-11	LEVER (EJECT-A) (BLACK)	

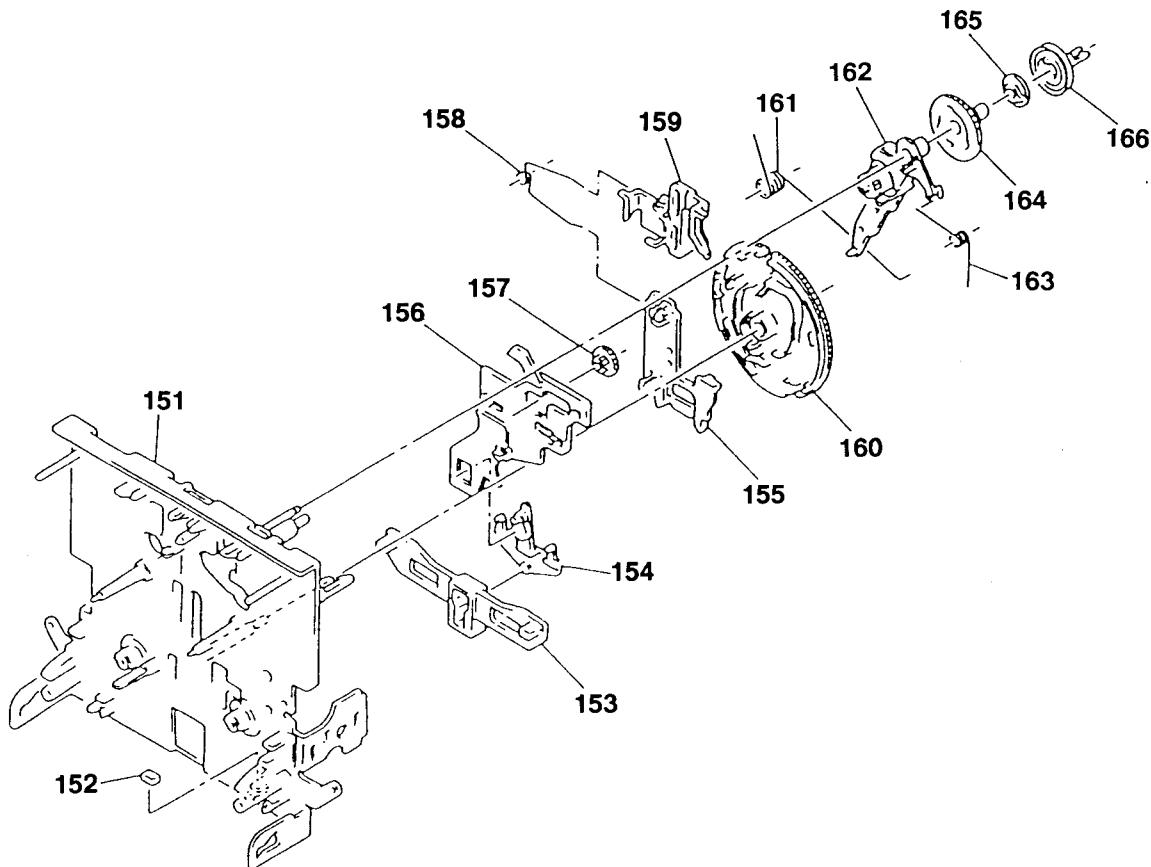
Ref. No. Part No. Description

Ref. No.	Part No.	Description	Remark
62	X-3371-697-1	HOLDER (L) ASSY, CASSETTE (TH)	
62	X-3372-081-1	HOLDER (L) ASSY, CASSETTE (AEP, UK, E, EA)	
63	X-3371-698-1	HOLDER (R) ASSY, CASSETTE (TH)	
63	X-3372-082-1	HOLDER (R) ASSY, CASSETTE (AEP, UK, E, EA)	
* 64	A-2007-478-A	TC PANEL BOARD, COMPLETE	
65	4-951-620-01	SCREW (2.6X8), +BVTIP	
66	3-354-961-01	SPRING (E) SAFTY SPRING L	
67	3-354-955-01	LEVER (E) SAFTY LEVER L	
68	4-959-231-11	SPRING (L), TORSION	
69	3-354-963-01	DAMPER	
70	3-354-962-01	SPRING (E) SAFTY SPRING R	
71	3-354-956-01	LEVER (E) SAFTY LEVER R	
72	4-959-232-11	SPRING (R), TORSION	
73	1-765-384-11	WIRE (FLAT TYPE) (7 CORE)	
74	3-354-957-01	JOINT (LOCK LEVER)	

6-3. MECHANISM SECTION-1 (DECK A: TCM-190RA12CL) (DECK B: TCM-190RB52C)



6-4. MECHANISM SECTION-2
(DECK A: TCM-190RA12CL)
(DECK B: TCM-190RB52C)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
151	X-3359-415-1	CHASSIS ASSY, MECHANICAL		159	3-359-429-11	SLIDER (BRAKE PLATE) (DECK B)	
152	3-359-469-01	SPACER		160	3-359-420-01	GEAR (CAM GEAR)	
153	3-359-425-01	SLIDER (REVERSE SLIDER)		161	3-359-456-01	SPRING (TRIGGER SPRING), TORSION	
154	3-359-426-01	LEVER (REVERSE LEVER)		162	X-3366-569-1	ARM ASSY, FR	
155	3-359-427-01	SLIDER (LEVERSE SLIDER)		163	3-924-185-11	SPRING (FR ARM), TORSION	
* 156	3-359-415-01	SLIDER (trigger SLIDER) (DECK A)		164	3-359-419-11	GEAR (FR GEAR)	
156	3-359-415-11	SLIDER (trigger SLIDER) (DECK B)		165	3-359-421-01	CLUTCH (REEL DISK)	
157	3-359-448-01	GEAR (trigger)		166	3-359-418-01	PULLEY (FR PULLEY)	
158	3-359-454-01	SPRING, TORSION					
159	3-359-429-01	SLIDER (BRAKE PLATE) (DECK A)					

AUDIO

SECTION 7 ELECTRICAL PARTS LIST

NOTE:

The components identified by mark \triangle or dotted line with mark \triangle are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

• RESISTORS

All resistors are in ohms

METAL: Metal-film resistor

METAL OXIDE: Metal Oxide-film resistor

F : nonflammable

• SEMICONDUCTORS

In each case, u: μ , for example:
uA...: μ A..., uPA...: μ PA..., uPB...: μ PB...,
uPC...: μ PC..., uPD...: μ PD...

• CAPACITORS

uF : μ F

• COILS

uH : μ H

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*	A-2007-266-A	AUDIO BOARD, COMPLETE (DECK A)		R23	1-216-100-00	METAL GLAZE	130K 5% 1/10W
		*****		R24	1-216-068-00	METAL CHIP	6.2K 5% 1/10W
		< CAPACITOR >		R31	1-216-033-00	METAL CHIP	220 5% 1/10W
				R32	1-216-033-00	METAL CHIP	220 5% 1/10W
C11	1-163-131-00	CERAMIC CHIP	390PF 5% 50V	R71	1-216-082-00	METAL GLAZE	24K 5% 1/10W
C12	1-136-157-00	FILM	0.022uF 5% 50V	R72	1-216-081-00	METAL CHIP	22K 5% 1/10W
C13	1-124-234-00	ELECT	22uF 20% 16V	R73	1-216-089-91	METAL GLAZE	47K 5% 1/10W
C18	1-163-251-11	CERAMIC CHIP	100PF 5% 50V	R74	1-216-089-91	METAL GLAZE	47K 5% 1/10W
C21	1-163-131-00	CERAMIC CHIP	390PF 5% 50V				< VARIABLE RESISTOR >
C22	1-136-157-00	FILM	0.022uF 5% 50V	RV11	1-241-761-11	RES, ADJ, CARBON 1K	
C23	1-124-234-00	ELECT	22uF 20% 16V	RV21	1-241-761-11	RES, ADJ, CARBON 1K	
C28	1-163-251-11	CERAMIC CHIP	100PF 5% 50V	RV71	1-241-630-11	RES, ADJ, CARBON 10K	
C31	1-124-234-00	ELECT	22uF 20% 16V	RV72	1-241-630-11	RES, ADJ, CARBON 10K	
C32	1-124-234-00	ELECT	22uF 20% 16V				
C72	1-109-889-11	ELECT	1uF 20% 50V				*****
		< CONNECTOR >		*	A-2007-133-A	AUDIO BOARD, COMPLETE (DECK B)	

* CNJ31	1-580-782-11	CONNECTOR, BOARD TO BOARD					< CAPACITOR >
CNJ72	1-764-902-11	CONNECTOR, FFC/FPC 4P					
* CNP32	1-580-772-11	PIN, CONNECTOR (PC BOARD) 4P					
* CNP71	1-564-719-11	PIN, CONNECTOR (SMALL TYPE) 3P					
		< IC >					
IC31	8-759-106-02	IC uPC4570G2					
		< JUMPER RESISTOR >					
JW1	1-216-295-91	CONDUCTOR, CHIP	(2012)	C11	1-163-131-00	CERAMIC CHIP	390PF 5% 50V
JW51	1-216-296-91	CONDUCTOR, CHIP	(3216)	C12	1-163-251-11	CERAMIC CHIP	100PF 5% 50V
JW52	1-216-296-91	CONDUCTOR, CHIP	(3216)	C13	1-136-153-00	FILM	0.01uF 5% 50V
JW53	1-216-296-91	CONDUCTOR, CHIP	(3216)	C14	1-126-177-11	ELECT	100uF 20% 10V
JW54	1-216-296-91	CONDUCTOR, CHIP	(3216)	C15	1-124-234-00	ELECT	22uF 20% 16V
		< TRANSISTOR >		C16	1-136-434-11	FILM	120PF 5% 630V
				C17	1-102-113-00	CERAMIC	390PF 10% 50V
Q71	8-729-216-22	TRANSISTOR 2SA1162-G		C18	1-163-237-11	CERAMIC CHIP	27PF 5% 50V
		< RESISTOR >		C21	1-163-131-00	CERAMIC CHIP	390PF 5% 50V
R11	1-216-099-00	METAL CHIP	120K 5% 1/10W	C22	1-163-251-11	CERAMIC CHIP	100PF 5% 50V
R12	1-216-025-91	METAL GLAZE	100 5% 1/10W	C23	1-136-153-00	FILM	0.01uF 5% 50V
R13	1-216-100-00	METAL GLAZE	130K 5% 1/10W	C24	1-126-177-11	ELECT	100uF 20% 10V
R14	1-216-068-00	METAL CHIP	6.2K 5% 1/10W	C25	1-124-234-00	ELECT	22uF 20% 16V
R21	1-216-099-00	METAL CHIP	120K 5% 1/10W	C26	1-136-434-11	FILM	120PF 5% 630V
R22	1-216-025-91	METAL GLAZE	100 5% 1/10W	C27	1-102-113-00	CERAMIC	390PF 10% 50V
				C28	1-163-237-11	CERAMIC CHIP	27PF 5% 50V
				C31	1-124-234-00	ELECT	22uF 20% 16V
				C32	1-124-234-00	ELECT	22uF 20% 16V
				C33	1-124-234-00	ELECT	22uF 20% 16V
				C51	1-164-182-11	CERAMIC CHIP	0.0033uF 10% 50V
				C52	1-164-182-11	CERAMIC CHIP	0.0033uF 10% 50V
				C53	1-163-019-00	CERAMIC CHIP	0.0068uF 10% 50V
				C54	1-107-364-11	FILM	0.012uF 5% 100V

AUDIO

LEAF SW-A

LEAF SW-A**LEAF SW-B****TC MAIN**

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>			<u>Remark</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>			<u>Remark</u>
< RESISTOR >											
R84	1-249-417-11	CARBON	1K	5%	1/4W	C110	1-126-961-11	ELECT	2.2uF	20%	50V
R85	1-249-408-11	CARBON	180	5%	1/4W	C111	1-162-282-31	CERAMIC	100PF	10%	50V
< SWITCH >											
S81	1-571-958-11	SWITCH, PUSH (1 KEY) (STOP DET)				C114	1-124-907-11	ELECT	10uF	20%	50V
S82	1-571-281-21	SWITCH, LEAF (CrO ₂ DET)				C115	1-124-443-00	ELECT	100uF	20%	10V
S86	1-571-281-21	SWITCH, LEAF (HALF DET)				C116	1-162-282-31	CERAMIC	100PF	10%	50V

*	1-638-020-11	LEAF SW-B BOARD				C119	1-124-902-00	ELECT	0.47uF	20%	50V

< CONNECTOR >											
* CNP81	1-568-850-11	SOCKET, CONNECTOR 7P				C120	1-126-963-11	ELECT	4.7uF	20%	50V
< IC >											
IC81	8-749-924-10	IC PHONT REFLECTOR NJL5165K-B(H1)				C130	1-162-282-31	CERAMIC	100PF	10%	50V
< RESISTOR >											
R81	1-249-414-11	CARBON	560	5%	1/4W	C131	1-162-282-31	CERAMIC	100PF	10%	50V
R82	1-247-818-11	CARBON	300	5%	1/4W	C132	1-124-903-11	ELECT	1uF	20%	50V
R83	1-247-834-11	CARBON	1.3K	5%	1/4W	C133	1-162-286-31	CERAMIC	220PF	10%	50V
R84	1-249-417-11	CARBON	1K	5%	1/4W	C202	1-162-294-31	CERAMIC	0.001uF	10%	50V
R85	1-249-408-11	CARBON	180	5%	1/4W	C203	1-162-282-31	CERAMIC	100PF	10%	50V
< SWITCH >											
S81	1-571-958-11	SWITCH, PUSH (1 KEY) (STOP DET)				C204	1-130-475-00	MYLAR	0.0022uF	5%	50V
S82	1-571-281-21	SWITCH, LEAF (CrO ₂ DET)				C205	1-130-475-00	MYLAR	0.0022uF	5%	50V
S83	1-571-281-21	SWITCH, LEAF (METAL DET)				C206	1-126-961-11	ELECT	2.2uF	20%	50V
S84	1-571-281-21	SWITCH, LEAF (ERASE PROOF (A))				C207	1-136-174-00	FILM	0.56uF	5%	50V
S85	1-571-281-21	SWITCH, LEAF (ERASE PROOF (B))				C208	1-136-171-00	FILM	0.33uF	5%	50V
S86	1-571-281-21	SWITCH, LEAF (HALF DET)				C209	1-126-961-11	ELECT	2.2uF	20%	50V

*	A-2007-477-A	TC MAIN BOARD, COMPLETE				C210	1-126-961-11	ELECT	2.2uF	20%	50V

7-685-646-79 SCREW +BVTP 3X8 TYPE2 N-S											
< CAPACITOR >											
C102	1-162-294-31	CERAMIC	0.001uF	10%	50V	C211	1-162-282-31	CERAMIC	100PF	10%	50V
C103	1-162-282-31	CERAMIC	100PF	10%	50V	C212	1-124-907-11	ELECT	10uF	20%	50V
C104	1-130-475-00	MYLAR	0.0022uF	5%	50V	C213	1-162-286-31	CERAMIC	220PF	10%	50V
C105	1-130-475-00	MYLAR	0.0022uF	5%	50V	C502	1-126-944-11	ELECT	3300uF	20%	16V
C106	1-126-961-11	ELECT	2.2uF	20%	50V	C504	1-126-944-11	ELECT	3300uF	20%	16V
C107	1-136-174-00	FILM	0.56uF	5%	50V	C518	1-124-907-11	ELECT	10uF	20%	50V
C108	1-136-171-00	FILM	0.33uF	5%	50V	C519	1-124-907-11	ELECT	10uF	20%	50V
C109	1-126-961-11	ELECT	2.2uF	20%	50V	C529	1-136-157-00	FILM	0.022uF	5%	50V

C533	1-136-157-00	FILM	0.022uF	5%	50V	C530	1-136-157-00	FILM	0.022uF	5%	50V
C534	1-136-157-00	FILM	0.022uF	5%	50V	C531	1-136-157-00	FILM	0.022uF	5%	50V
C535	1-126-942-61	ELECT	1000uF	20%	16V	C532	1-124-903-11	ELECT	1uF	20%	50V
C536	1-126-942-61	ELECT	1000uF	20%	16V	C533	1-162-286-31	CERAMIC	220PF	10%	50V
C537	1-124-472-11	ELECT	470uF	20%	10V	C534	1-124-472-11	ELECT	470uF	20%	10V
C538	1-124-472-11	ELECT	470uF	20%	10V	C535	1-124-472-11	ELECT	470uF	20%	10V

C540	1-126-926-11	ELECT	1000uF	20%	10V	C601	1-124-443-00	ELECT	100uF	20%	10V
C601	1-124-443-00	ELECT	100uF	20%	10V	C602	1-164-159-11	CERAMIC	0.1uF	50%	50V
C603	1-162-282-31	CERAMIC	100PF	10%	50V	C604	1-164-159-11	CERAMIC	0.1uF	50%	50V
C606	1-124-480-11	ELECT	470uF	20%	25V	C607	1-124-480-11	ELECT	470uF	20%	25V
C607	1-124-480-11	ELECT	470uF	20%	25V	C608	1-124-480-11	ELECT	470uF	20%	25V

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>		<u>Remark</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>
C609	1-124-902-00	ELECT	0.47uF	20%	50V	D603	8-719-987-63	DIODE IN4148M
C610	1-124-472-11	ELECT	470uF	20%	10V	D604	8-719-987-63	DIODE IN4148M
C611	1-162-290-31	CERAMIC	470PF	10%	50V	D605	8-719-024-99	DIODE 11ES2-NTA2B
C612	1-124-472-11	ELECT	470uF	20%	10V	D606	8-719-024-99	DIODE 11ES2-NTA2B
C613	1-162-290-31	CERAMIC	470PF	10%	50V	D607	8-719-987-63	DIODE IN4148M
C614	1-164-159-11	CERAMIC	0.1uF		50V	D608	8-719-987-63	DIODE IN4148M
C615	1-164-159-11	CERAMIC	0.1uF		50V	D610	8-719-024-99	DIODE 11ES2-NTA2B
C616	1-124-910-11	ELECT	47uF	20%	50V	D611	8-719-987-63	DIODE IN4148M
C617	1-164-159-11	CERAMIC	0.1uF		50V	D620	8-719-012-68	DIODE UZ-2.7BSA-TP
C620	1-124-907-11	ELECT	10uF	20%	50V			< IC >
C621	1-124-907-11	ELECT	10uF	20%	50V	IC101	8-752-058-57	IC CXA1599Q
C622	1-124-477-11	ELECT	47uF	20%	25V	IC102	8-759-939-73	IC BA3308
C623	1-124-477-11	ELECT	47uF	20%	25V	IC103	8-752-059-55	IC CXA1331S
C630	1-126-963-11	ELECT	4.7uF	20%	50V	IC104	8-759-337-73	IC M38123M4-118FP
C631	1-124-903-11	ELECT	1uF	20%	50V	IC502	8-759-231-53	IC TA7805S
C636	1-126-965-11	ELECT	22uF	20%	50V	IC503	8-759-604-86	IC M5F7807L
C641	1-126-963-11	ELECT	4.7uF	20%	50V	IC504	8-759-604-90	IC M5F7907L
C642	1-124-902-00	ELECT	0.47uF	20%	50V	IC505	8-759-604-86	IC M5F7807L
C645	1-124-907-11	ELECT	10uF	20%	50V	IC506	8-759-604-90	IC M5F7907L
C646	1-126-961-11	ELECT	2.2uF	20%	50V	IC602	8-759-256-72	IC PST994D
C649	1-124-907-11	ELECT	10uF	20%	50V	IC603	8-759-266-35	IC TA8242AK
C650	1-126-965-11	ELECT	22uF	20%	50V	IC604	8-759-000-48	IC MC14052BCP
C651	1-124-443-00	ELECT	100uF	20%	10V			< COIL >
C800	1-162-286-31	CERAMIC	220PF	10%	50V	L601	1-414-189-31	INDUCTOR 100uH
C6035	1-162-294-31	CERAMIC	0.001uF	10%	50V	L6002	1-414-183-41	INDUCTOR 10uH
< CONNECTOR >								
CN601	1-695-330-31	PIN, CONNECTOR (PC BOARD) 7P						
* CN602	1-691-916-11	CONNECTOR, BOARD TO BOARD						
CN603	1-695-330-31	PIN, CONNECTOR (PC BOARD) 7P						
* CN604	1-691-916-11	CONNECTOR, BOARD TO BOARD						
* CN605	1-691-916-11	CONNECTOR, BOARD TO BOARD						
CN608	1-770-166-11	CONNECTOR, FFC/FPC 17P						
CN609	1-770-158-21	HOUSING, CONNECTOR 7P (SYSTEM CONTROL)						
< DIODE >								
D508	8-719-024-99	DIODE 11ES2-NTA2B				Q101	8-729-119-78	TRANSISTOR 2SC2785-HFE
D509	8-719-024-99	DIODE 11ES2-NTA2B				Q122	8-729-900-89	TRANSISTOR DTC144ES
D510	8-719-024-99	DIODE 11ES2-NTA2B				Q201	8-729-119-78	TRANSISTOR 2SC2785-HFE
D511	8-719-024-99	DIODE 11ES2-NTA2B				Q222	8-729-900-89	TRANSISTOR DTC144ES
D512	8-719-024-99	DIODE 11ES2-NTA2B				Q603	8-729-801-93	TRANSISTOR 2SD1387
D513	8-719-024-99	DIODE 11ES2-NTA2B				Q604	8-729-801-93	TRANSISTOR 2SD1387
D519	8-719-024-99	DIODE 11ES2-NTA2B				Q605	8-729-900-80	TRANSISTOR DTC114ES
D522	8-719-024-99	DIODE 11ES2-NTA2B				Q607	8-729-900-89	TRANSISTOR DTC144ES
D523	8-719-987-63	DIODE IN4148M				Q608	8-729-900-89	TRANSISTOR DTC144ES
D524	8-719-987-63	DIODE IN4148M				Q609	8-729-900-89	TRANSISTOR DTC144ES
D525	8-719-024-99	DIODE 11ES2-NTA2B				Q611	8-729-119-78	TRANSISTOR 2SC2785-HFE
D526	8-719-024-99	DIODE 11ES2-NTA2B				Q612	8-729-119-76	TRANSISTOR 2SA1175-HFE
D601	8-719-987-63	DIODE IN4148M				Q613	8-729-900-65	TRANSISTOR DTA144ES
D602	8-719-987-63	DIODE IN4148M				Q614	8-729-900-89	TRANSISTOR DTC144ES
						Q620	8-729-900-89	TRANSISTOR DTC144ES
						Q621	8-729-900-65	TRANSISTOR DTA144ES
						Q627	8-729-900-89	TRANSISTOR DTC144ES

TC MAIN

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
Q630	8-729-422-57	TRANSISTOR	UN4111	△R621	1-212-853-00	FUSIBLE	6.8 5% 1/4W F
Q802	8-729-900-80	TRANSISTOR	DTC114ES	R622	1-249-421-11	CARBON	2.2K 5% 1/4W
Q803	8-729-900-80	TRANSISTOR	DTC114ES	R623	1-249-421-11	CARBON	2.2K 5% 1/4W
Q804	8-729-900-80	TRANSISTOR	DTC114ES	R624	1-249-434-11	CARBON	27K 5% 1/4W
Q805	8-729-900-80	TRANSISTOR	DTC114ES	R625	1-249-421-11	CARBON	2.2K 5% 1/4W
	< RESISTOR >			R626	1-249-421-11	CARBON	2.2K 5% 1/4W
R106	1-249-418-11	CARBON	1.2K 5% 1/4W	R627	1-249-421-11	CARBON	2.2K 5% 1/4W
R107	1-247-864-11	CARBON	24K 5% 1/4W	R628	1-249-434-11	CARBON	27K 5% 1/4W
R108	1-249-414-11	CARBON	560 5% 1/4W	R629	1-249-421-11	CARBON	2.2K 5% 1/4W
R109	1-249-429-11	CARBON	10K 5% 1/4W	R630	1-249-429-11	CARBON	10K 5% 1/4W
R110	1-249-427-11	CARBON	6.8K 5% 1/4W	R631	1-249-421-11	CARBON	2.2K 5% 1/4W
R111	1-249-427-11	CARBON	6.8K 5% 1/4W	R632	1-249-429-11	CARBON	10K 5% 1/4W
R112	1-247-832-11	CARBON	1.1K 5% 1/4W	R633	1-247-807-31	CARBON	100 5% 1/4W
R113	1-249-429-11	CARBON	10K 5% 1/4W	R634	1-247-807-31	CARBON	100 5% 1/4W
R114	1-249-421-11	CARBON	2.2K 5% 1/4W	R637	1-249-414-11	CARBON	560 5% 1/4W
R115	1-247-887-00	CARBON	220K 5% 1/4W	R640	1-249-429-11	CARBON	10K 5% 1/4W
R116	1-249-437-11	CARBON	47K 5% 1/4W	R641	1-247-807-31	CARBON	100 5% 1/4W
R117	1-249-419-11	CARBON	1.5K 5% 1/4W	R642	1-249-424-11	CARBON	3.9K 5% 1/4W
R118	1-249-438-11	CARBON	56K 5% 1/4W	R648	1-249-437-11	CARBON	47K 5% 1/4W
R119	1-247-834-11	CARBON	1.3K 5% 1/4W	R649	1-249-437-11	CARBON	47K 5% 1/4W
R120	1-247-807-31	CARBON	100 5% 1/4W	R650	1-249-437-11	CARBON	47K 5% 1/4W
R121	1-247-807-31	CARBON	100 5% 1/4W	R656	1-249-393-11	CARBON	10 5% 1/4W
R122	1-249-426-11	CARBON	5.6K 5% 1/4W	R660	1-249-417-11	CARBON	1K 5% 1/4W
R206	1-249-418-11	CARBON	1.2K 5% 1/4W	R661	1-249-434-11	CARBON	27K 5% 1/4W
R207	1-247-864-11	CARBON	24K 5% 1/4W	R670	1-249-433-11	CARBON	22K 5% 1/4W
R208	1-249-414-11	CARBON	560 5% 1/4W	R673	1-249-429-11	CARBON	10K 5% 1/4W
R209	1-249-429-11	CARBON	10K 5% 1/4W	R674	1-247-860-11	CARBON	16K 5% 1/4W
R210	1-249-427-11	CARBON	6.8K 5% 1/4W	R675	1-249-429-11	CARBON	10K 5% 1/4W
R211	1-249-427-11	CARBON	6.8K 5% 1/4W	R676	1-249-434-11	CARBON	27K 5% 1/4W
R212	1-247-832-11	CARBON	1.1K 5% 1/4W	R677	1-247-807-31	CARBON	100 5% 1/4W
R213	1-249-429-11	CARBON	10K 5% 1/4W	R678	1-247-807-31	CARBON	100 5% 1/4W
R214	1-249-421-11	CARBON	2.2K 5% 1/4W	R679	1-247-807-31	CARBON	100 5% 1/4W
R215	1-247-887-00	CARBON	220K 5% 1/4W	R680	1-249-433-11	CARBON	22K 5% 1/4W
R216	1-249-437-11	CARBON	47K 5% 1/4W	R681	1-249-429-11	CARBON	10K 5% 1/4W
R217	1-249-419-11	CARBON	1.5K 5% 1/4W	R682	1-249-429-11	CARBON	10K 5% 1/4W
R218	1-249-438-11	CARBON	56K 5% 1/4W	R683	1-249-429-11	CARBON	10K 5% 1/4W
R219	1-247-834-11	CARBON	1.3K 5% 1/4W	R684	1-249-413-11	CARBON	470 5% 1/4W
R220	1-247-807-31	CARBON	100 5% 1/4W	R685	1-249-429-11	CARBON	10K 5% 1/4W
R221	1-247-807-31	CARBON	100 5% 1/4W	R686	1-249-429-11	CARBON	10K 5% 1/4W
R222	1-249-426-11	CARBON	5.6K 5% 1/4W	R687	1-249-417-11	CARBON	1K 5% 1/4W
R504	1-247-807-31	CARBON	100 5% 1/4W	R689	1-247-872-11	CARBON	51K 5% 1/4W
R505	1-249-429-11	CARBON	10K 5% 1/4W	R690	1-249-429-11	CARBON	10K 5% 1/4W
R601	1-247-807-31	CARBON	100 5% 1/4W	R691	1-249-429-11	CARBON	10K 5% 1/4W
R602	1-247-807-31	CARBON	100 5% 1/4W	R693	1-249-433-11	CARBON	22K 5% 1/4W
R606	1-249-435-11	CARBON	33K 5% 1/4W	R694	1-249-433-11	CARBON	22K 5% 1/4W
R607	1-247-807-31	CARBON	100 5% 1/4W	R695	1-249-421-11	CARBON	2.2K 5% 1/4W
R609	1-249-429-11	CARBON	10K 5% 1/4W	R696	1-249-421-11	CARBON	2.2K 5% 1/4W
R615	1-247-807-31	CARBON	100 5% 1/4W	R700	1-247-903-00	CARBON	1M 5% 1/4W
R616	1-249-433-11	CARBON	22K 5% 1/4W	R701	1-249-429-11	CARBON	10K 5% 1/4W
R620	1-249-429-11	CARBON	10K 5% 1/4W	R702	1-249-437-11	CARBON	47K 5% 1/4W

The components identified by mark △ or dotted line with mark △ are critical for safety.
Replace only with part number specified.

TC MAIN

TC PANEL

TC-EX90/EX100

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>
ACCESSORIES & PACKING MATERIALS			

*	3-933-134-01	CUSHION (LOWER)	
*	3-933-164-01	CUSHION (UPPER)	

HARDWARE LIST			

#1	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
#2	7-621-770-67	SCREW +BVTT 2.6X6 (S)	
#3	7-621-775-00	SCREW +B 2.6X3	
#4	7-627-556-08	SCREW +P 2.6X2.8	
#5	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	

MC-Service

9-960-500-11

Sony Corporation
Consumer A&V Products Company
Home A&V Products Div.

— 34 —

English

96B0978-1

Printed in Japan

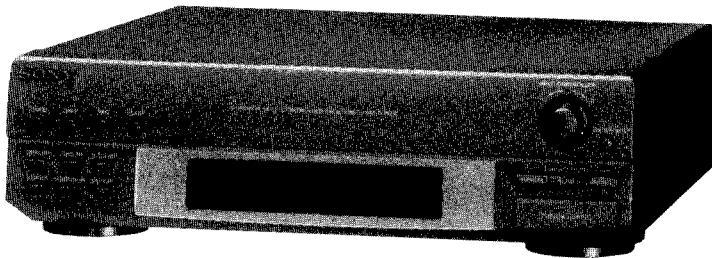
© 1996. 2

Published by Home A&V Products Div.
Quality Engineering Dept.

ST-EX100

SERVICE MANUAL

AEP Model
UK Model
E Model



This set is the tuner section in
MHC-EX50/EX70AV/EX90/
EX100AV.

Photo : E mode (SILVER)

SPECIFICATIONS

FM stereo, FM/AM superheterodyne tuner

FM tuner section

Tuning range 87.5 – 108.0 MHz
(50 kHz step)
Aerial FM lead aerial
Aerial terminals 75 ohm unbalanced
Intermediate frequency 10.7 MHz

AM tuner section

Tuning range
Italian model:
AM: 522 – 1,611 kHz
(with the interval set at
9 kHz)
German model:
AM: 531 – 1,602 kHz
(with the interval set at
9 kHz)

E, Saudi Arabia, Thailand models:

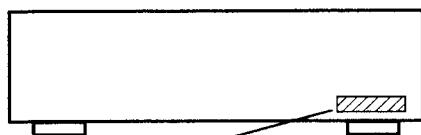
AM: 531 – 1,602 kHz
(with the interval set at
9 kHz)
530 – 1,710 kHz
(with the interval set at
10 kHz)

Other models:

MW: 531 – 1,602 kHz
(with the interval set at
9 kHz)
LW: 153 – 279 kHz
(with the interval set at
3 kHz)
Aerial AM loop aerial,
External aerial
terminals
Intermediate frequency 450 kHz
Dimensions Approx. 280 x 82.5 x 285 mm
(11 1/8 x 3 1/4 x 11 1/4 in) (w/h/d)
incl. projecting parts and controls
Mass Approx. 1.5 kg
(3 lb 4 oz)



FM STEREO/FM-AM TIMER TUNER
SONY®

MODEL IDENTIFICATION**— Back Panel —**

4-978-999-0□...E model

4-978-999-1□...AEP, UK, German, Italian, CIS model
(Made in France)

4-978-999-2□...AEP, UK model (Made in Malaysia)

4-978-999-3□...Saudi Arabia model

4-978-999-4□...Thailand model

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
SECTION 1. SERVICING NOTE	3	
SECTION 2. GENERAL	4	
SECTION 3. DISASSEMBLY		
3-1. Panel Board	5	
3-2. Back Panel, Main Board and Polar Board	5	
SECTION 4. ELECTRICAL ADJUSTMENTS	6	
SECTION 5. DIAGRAMS		
5-1. IC Block Diagrams	8	
5-2. Printed Wiring Board	11	
5-3. Schematic Diagram	13	
5-4. IC Pin Function		
• IC201 System Control (μ PD78013GC)	17	
SECTION 6. EXPLODED VIEW	19	
SECTION 7. ELECTRICAL PARTS LIST	20	

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY MARK Δ OR DOTTED LINE WITH MARK Δ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SECTION 1

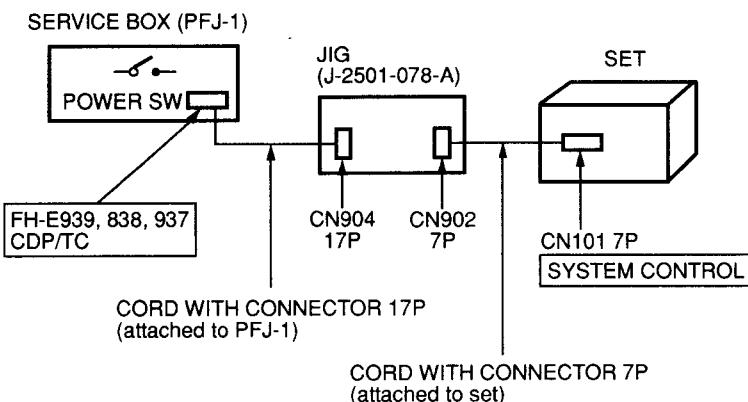
SERVICING NOTE

How to operate with a single unit.

Normally, this set is not operated with its own.

The exclusive jig (J-2501-078-A) and service box (PFJ-1) are necessary to operate the set with a single unit.

Turn the power set of the service box ON. Then press the ENTER/NEXT button and SLEEP button at the same time to turn the power on.



• KEY/FL tube/LED check mode.

To enter KEY/FL/LED check mode, press the ENTER/NEXT and REC buttons at the same time.

Under mode, every time when press any key or turn MULTI CONTROLLER knob, change to next situation.

- ① All LED indicators light on
- ② All FL tube indicators light on
- ③ A part of FL tube light on mode 1. (Indicated ST-SEG)
- ④ A part of FL tube light on mode 2. (Indicated RDS-SEG)
- ⑤ KEY check mode

Note :

- 1) All LED light on mode is kepted, when buttons which is pressed to enter all LED light on mode, release same time.
When release them separate timing, it is moved to next All LED light on mode.
- 2) After all LED light on mode, light on point remove one by one, when any button pressed or MULTI CONTROLLER knob turned.
- 3) Under KEY check mode, every time buttons pressed numerical value of "KEY" in FL tube increase.
And that time, numerical value of "ECDR" increase when MULTI CONTROLLER button turn to + direction, and it decrease turn to - direction.

When you want to finish this mode, unplug the power of amplifire or turn off PFJ-1 of POWER switch.

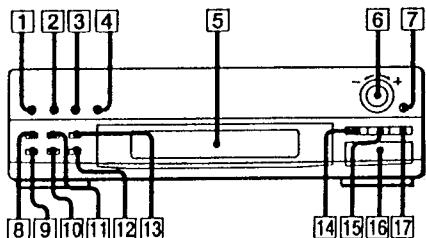
SECTION 2

GENERAL

This section is extracted
from instruction manual.

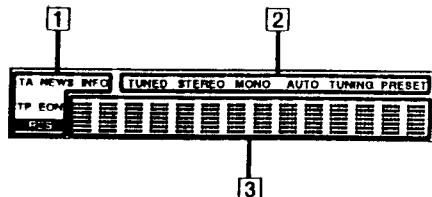
Index to Parts and Controls

Front Panel



- [1] ONCE button* (25, 26)
- [2] DAILY button* (25, 26)
- [3] REC button* (26)
- [4] SLEEP button* (25)
- [5] Display window (6, 10, 25)
- [6] MULTI CONTROLLER*
(6, 10, 11, 13, 26)
- [7] ENTER/NEXT button* (6, 11, 26)
- [8] CHARACTER button (11)
- [9] EON (Enhanced Other Networks)
button (12) (AEP, UK, G, IT)
MEMORY button (E, EA, CIS, TH)
- [10] PTY (Programme Type) button (13)
(AEP, G, IT, UK)
STEREO/MONO button
(E, EA, CIS, TH)
- [11] TIMER SET button (25)
- [12] DISPLAY button (11, 12)
- [13] CLOCK SET button (6)
- [14] STEREO/MONO button (10)
MANUAL button (E, EA, CIS, TH)
- [15] TUNING MODE button (10)
(AEP, UK, G, IT)
AUTO button
(E, EA, CIS, TH)
- [16] TUNER/BAND button (10, 18, 30)
- [17] MEMORY button (11)
(AEP, UK, G, IT)
PRESET button (E, EA, CIS, TH)

Display Window



- [1] RDS service indications (12) (AEP, UK, G, IT)
- [2] Tuner indication (10)
- [3] Frequency/station name/time/timer
indication (6, 10, 11, 25)

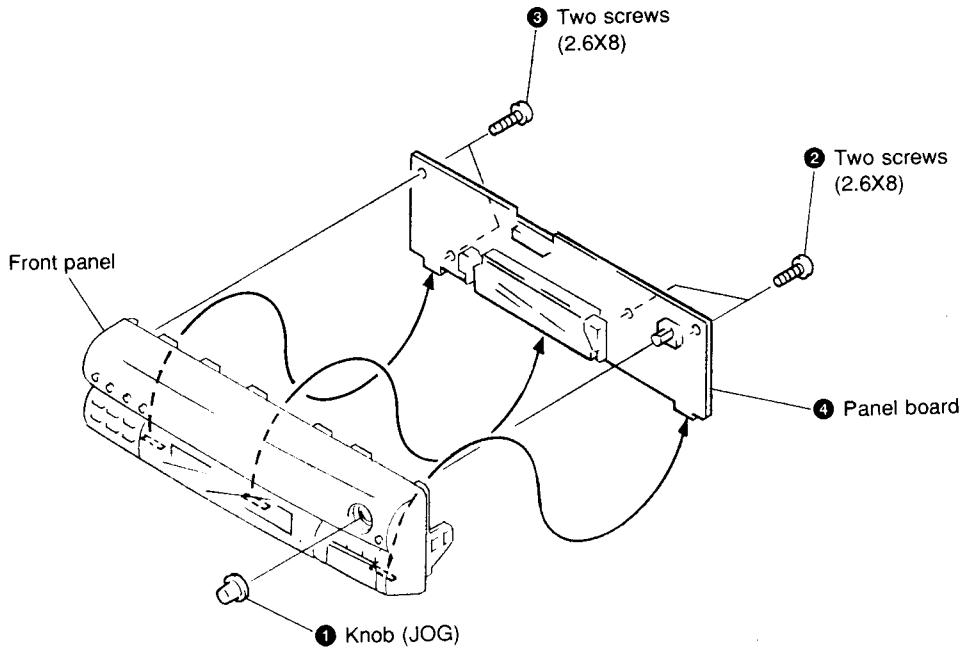
- Abbreviation
- G : German model.
- IT : Italian model.
- EA : Saudi Arabia model.
- TH : Thailand model

SECTION 3

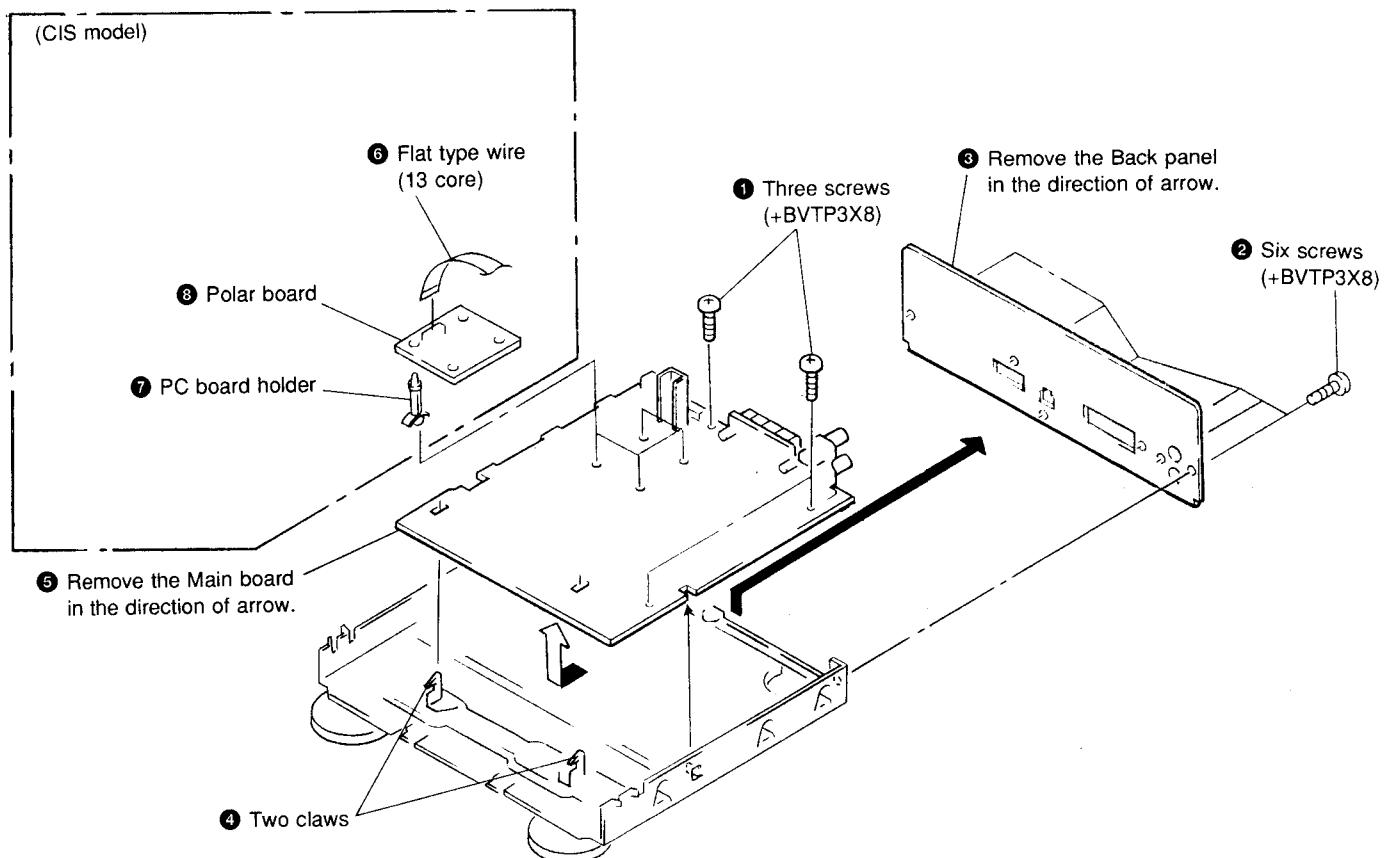
DISASSEMBLY

Note : Follow the disassembly procedure in the numerical order given.

3-1. PANEL BOARD



3-2. BACK PANEL, MAIN BOARD AND POLAR BOARD



SECTION 4

ELECTRICAL ADJUSTMENTS

Precautions in Repairing

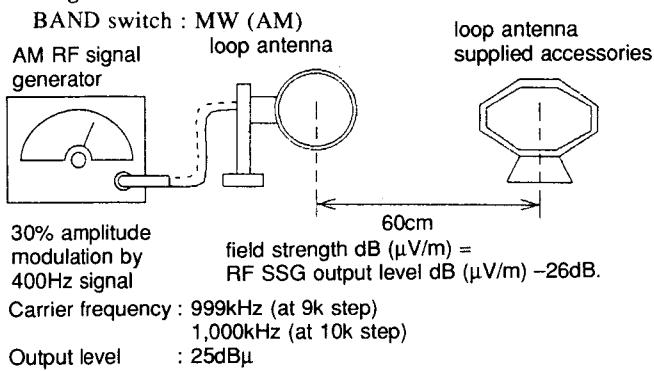
If the front unit fails, it is difficult to repair the inner circuits, so replace the entire front end unit.

The FM TUNED level must be adjusted after the AM TUNED level adjustment has completed.

AM SECTION

AM Tuning Level Adjustment

Setting :



Procedure :

1. Set loop antenna A so that the loop antenna B input level becomes 55dB μ /m.
2. Tune the set to 999kHz or 1,000 kHz.
3. Adjust RV1 so that the TUNED indicator goes on.

Adjustment Location : MAIN board. (See page 7)

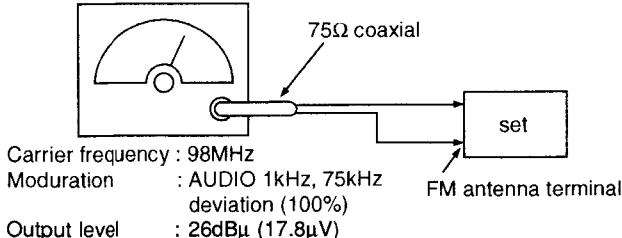
FM SECTION

FM Tuning Level Adjustment

Setting :

BAND switch : FM

FM RF signal generator



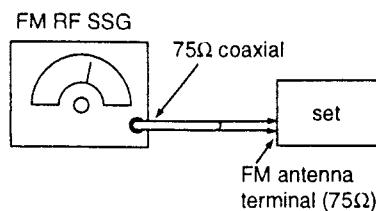
Procedure :

1. Tune the set to 98MHz.
2. Adjust RV2 so that the TUNED indicator goes on.

Adjustment Location : MAIN board. (See page 7)

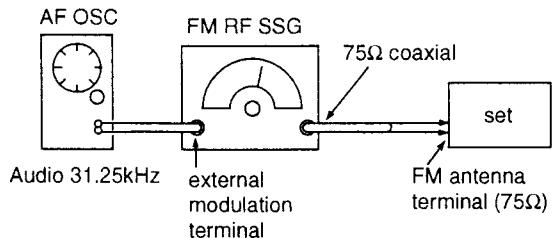
FM Polar Adjustment (CIS model only)

Connection 1 :



Carrier frequency : 69MHz
Output level : 1mV (60dB μ) (at 75Ω open)
Modulation : AUDIO 1kHz, 10kHz deviation

Connection 2 :



Carrier frequency : 69MHz
Output level : 1mV (60dB μ) (at 75Ω open)
Modulation : AUDIO 31.25kHz, 10kHz deviation
(EXTERNAL MODULATION)

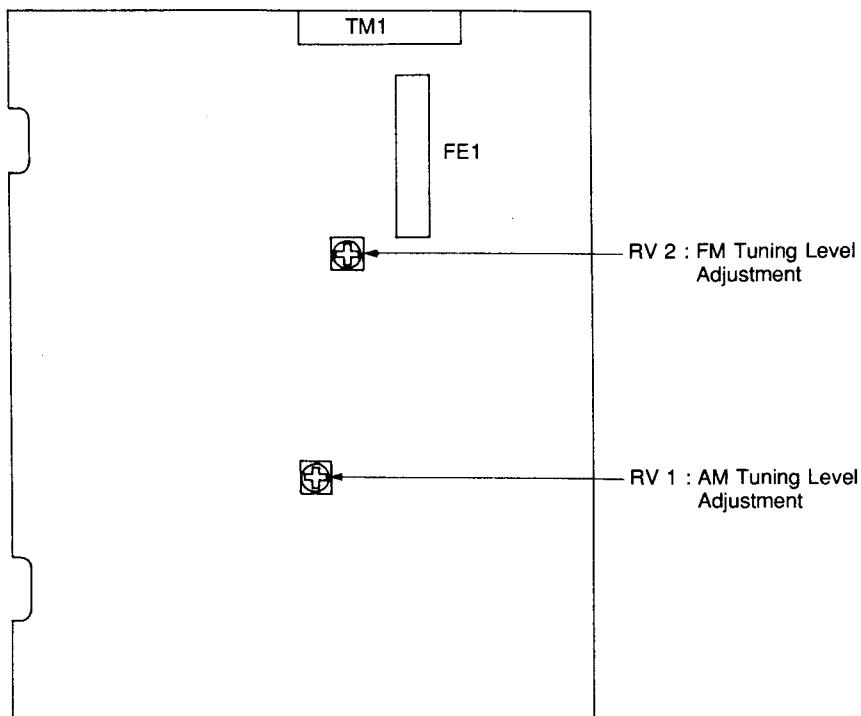
Procedure :

1. Set the modulation of FM RF SSG to AUDIO 1 kHz, 10 kHz deviation according to "Connection 1".
2. Tune the set to 69 MHz.
3. Adjust the RV1702 so that the reading of frequency counter connected to TP1702 becomes within $31.25\text{ kHz} \pm 0.05\text{ kHz}$. (VCO frequency adjustment)
4. Then record the reading of the level meter connected to TP1701.
5. Set the modulation of FM RF SSG to AUDIO 31.25 kHz, 10 kHz deviation according to "Connection 2".
6. Tune the set to 69 MHz.
7. Set the CT1701 to be mechanical center.
8. Adjust the L1701 so that the reading of the level meter connected to TP1701 becomes maximum. Then adjust the CT1701 so that the reading of the level meter connected to TP1701 becomes maximum. (SUB CARRIER PEAK Adjustment)
9. Adjust the RV1701 so that the level at the moment becomes 14 dB higher value than the level recorded in step 4. (SUB CARRIER LEVEL Adjustment)

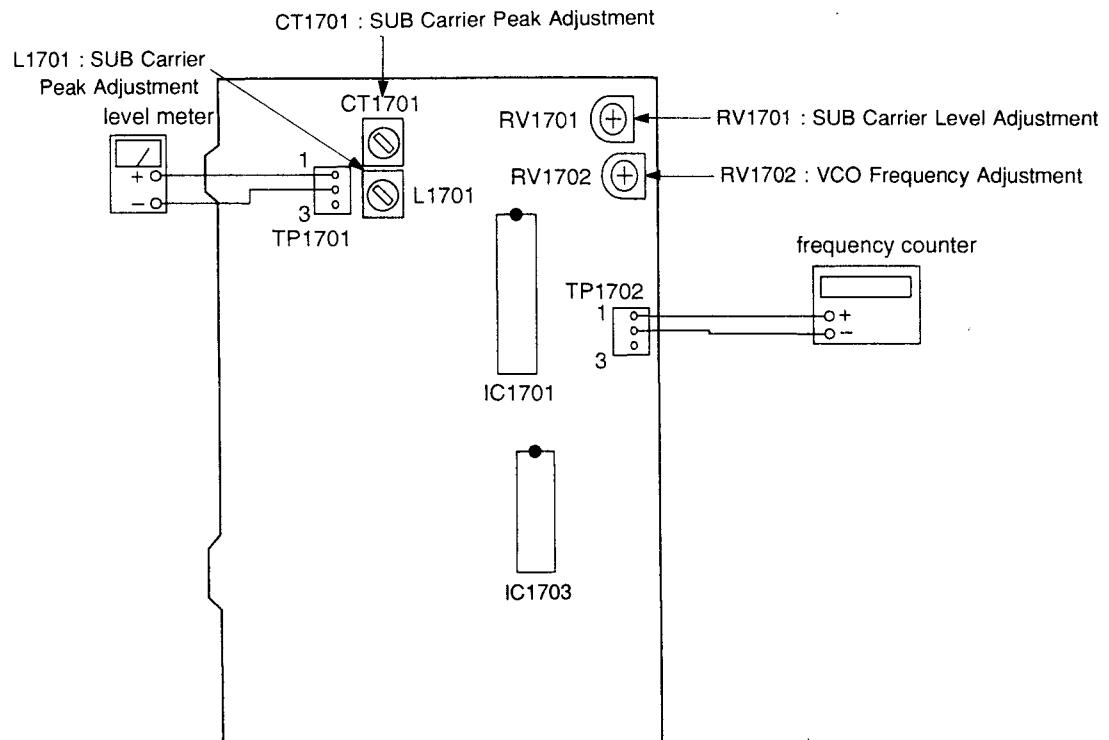
Adjustment Location : Polar board. (See page 7)

Adjustment Location

[MAIN BOARD] — Component side —



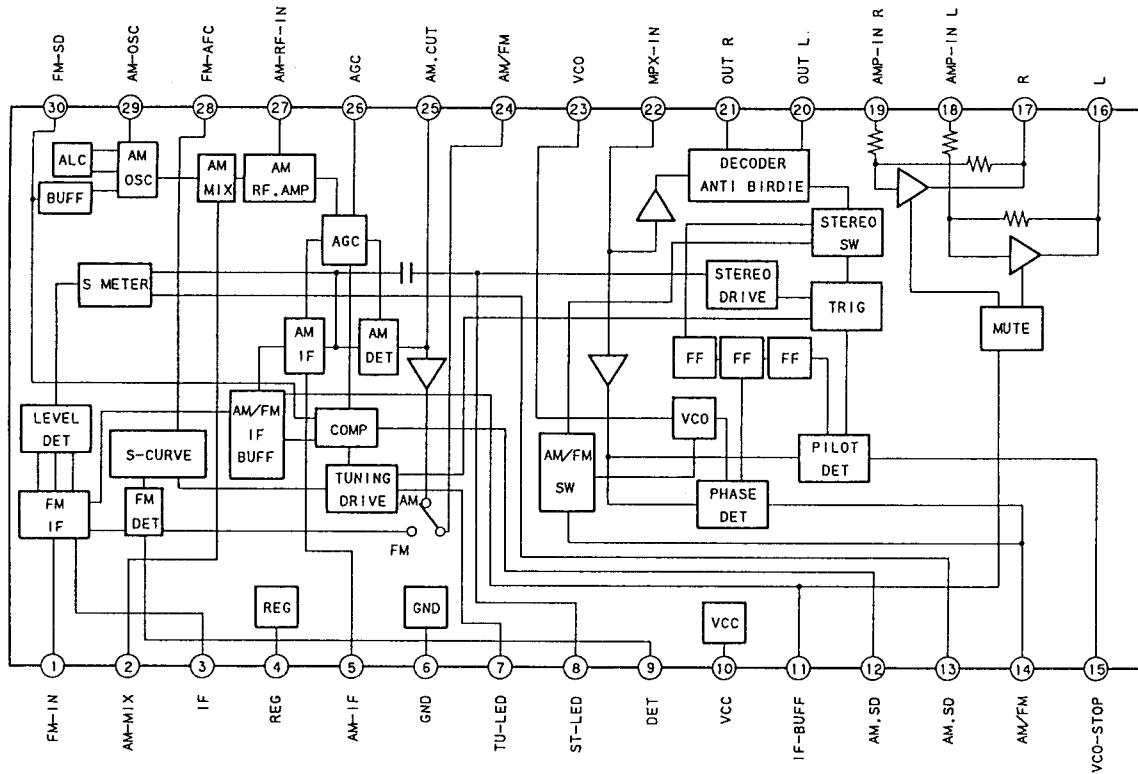
[POLAR BOARD] — Component side —



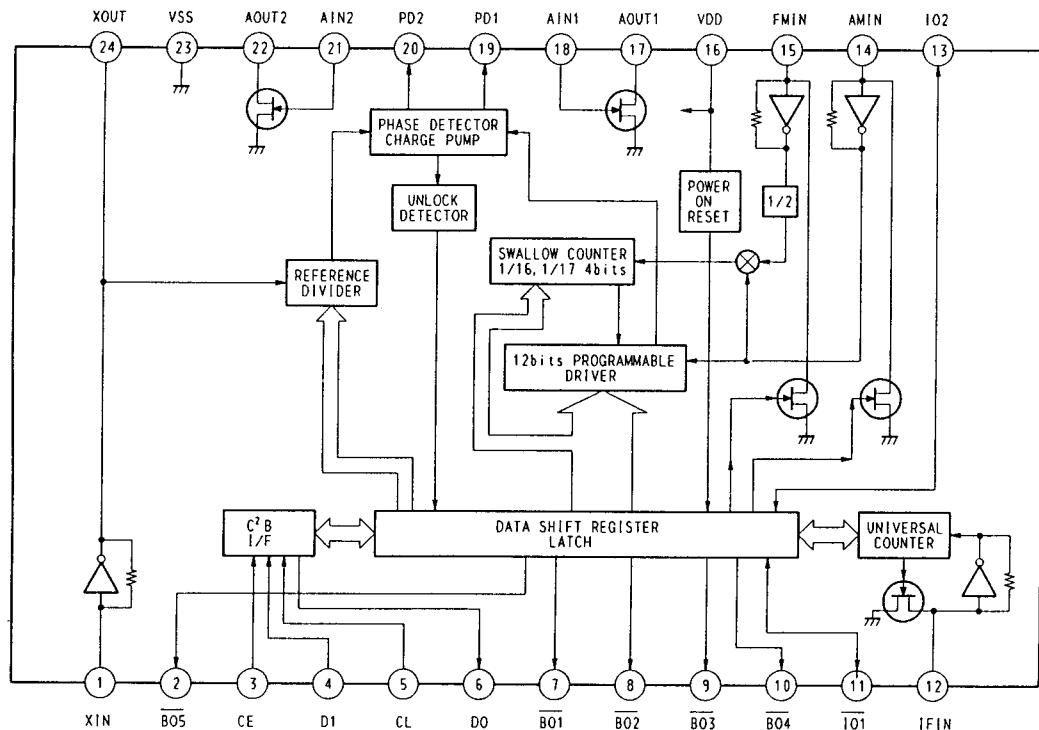
SECTION 5 DIAGRAMS

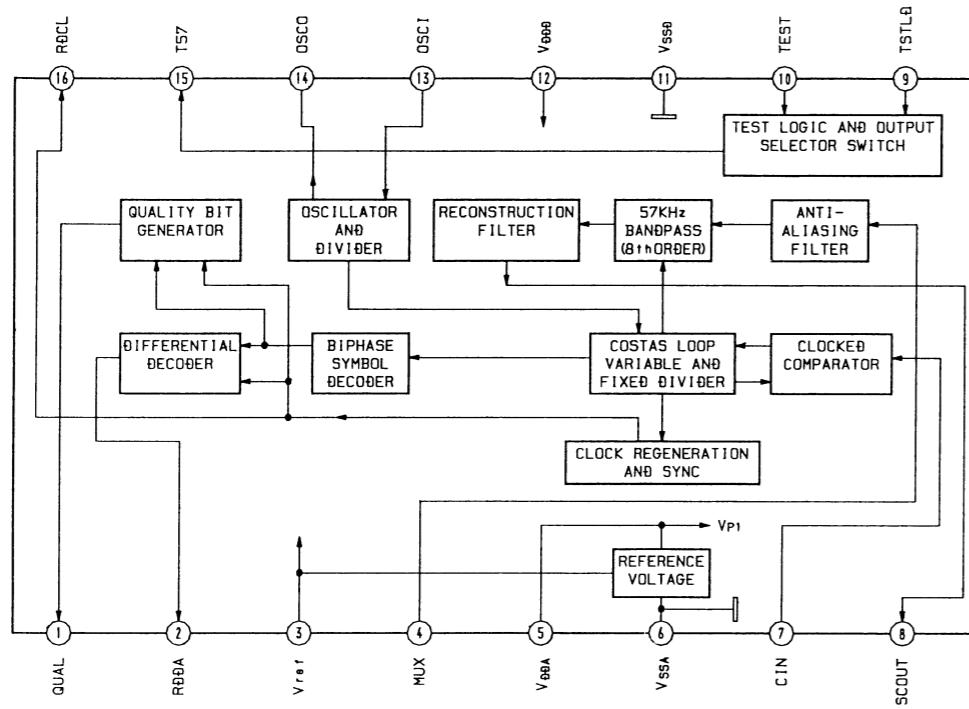
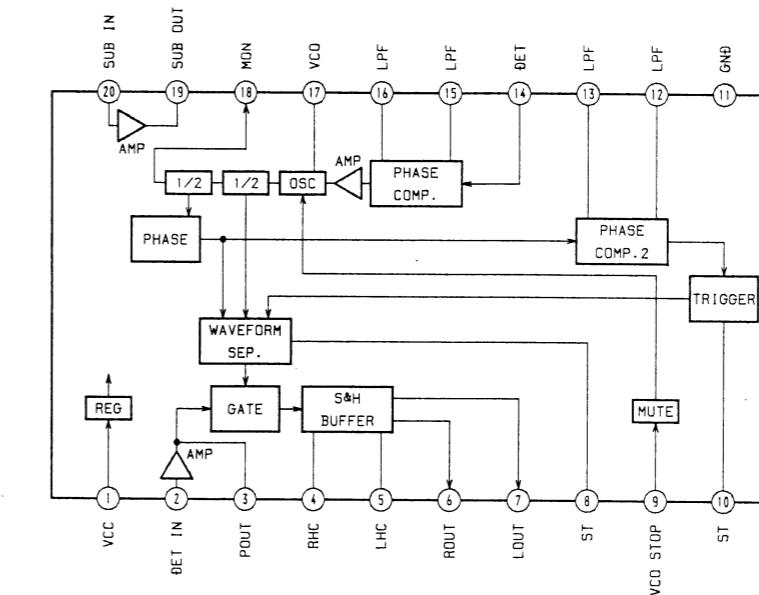
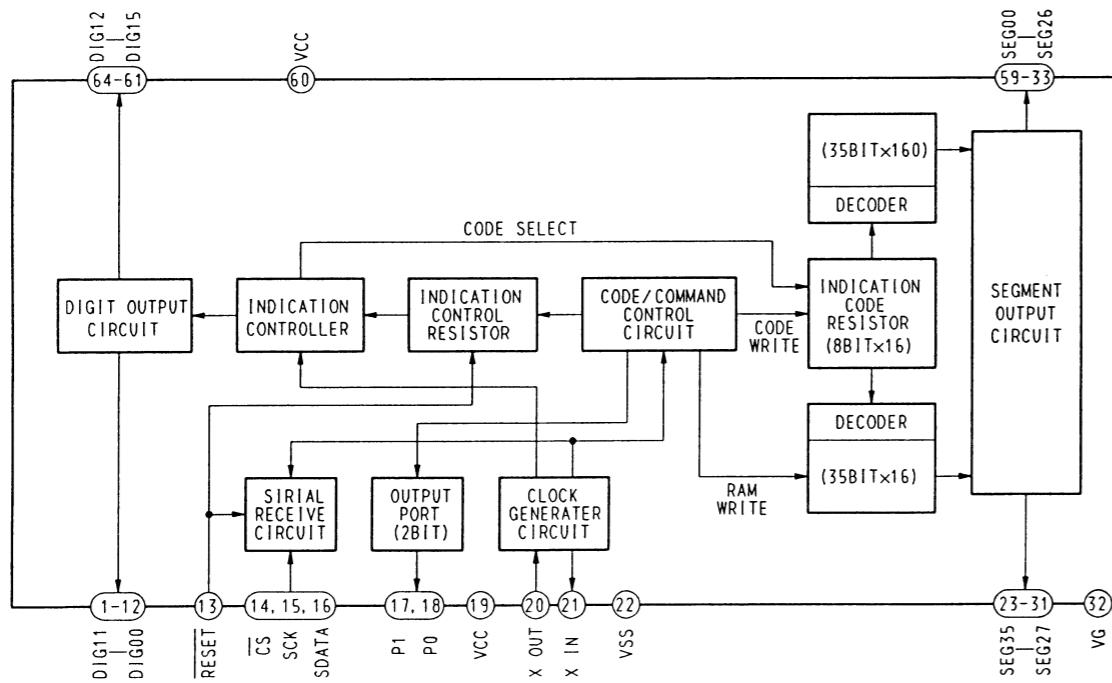
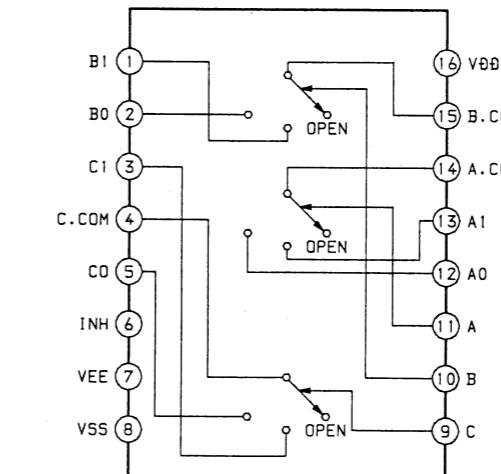
5-1. IC BLOCK DIAGRAMS

IC1 LA1835



IC51 LC72130



IC302 SAA6579**IC1701 IR3R42****IC601 M66004M6FP****IC1703 MC14053BCP**

5-2. PRINTED WIRING BOARD

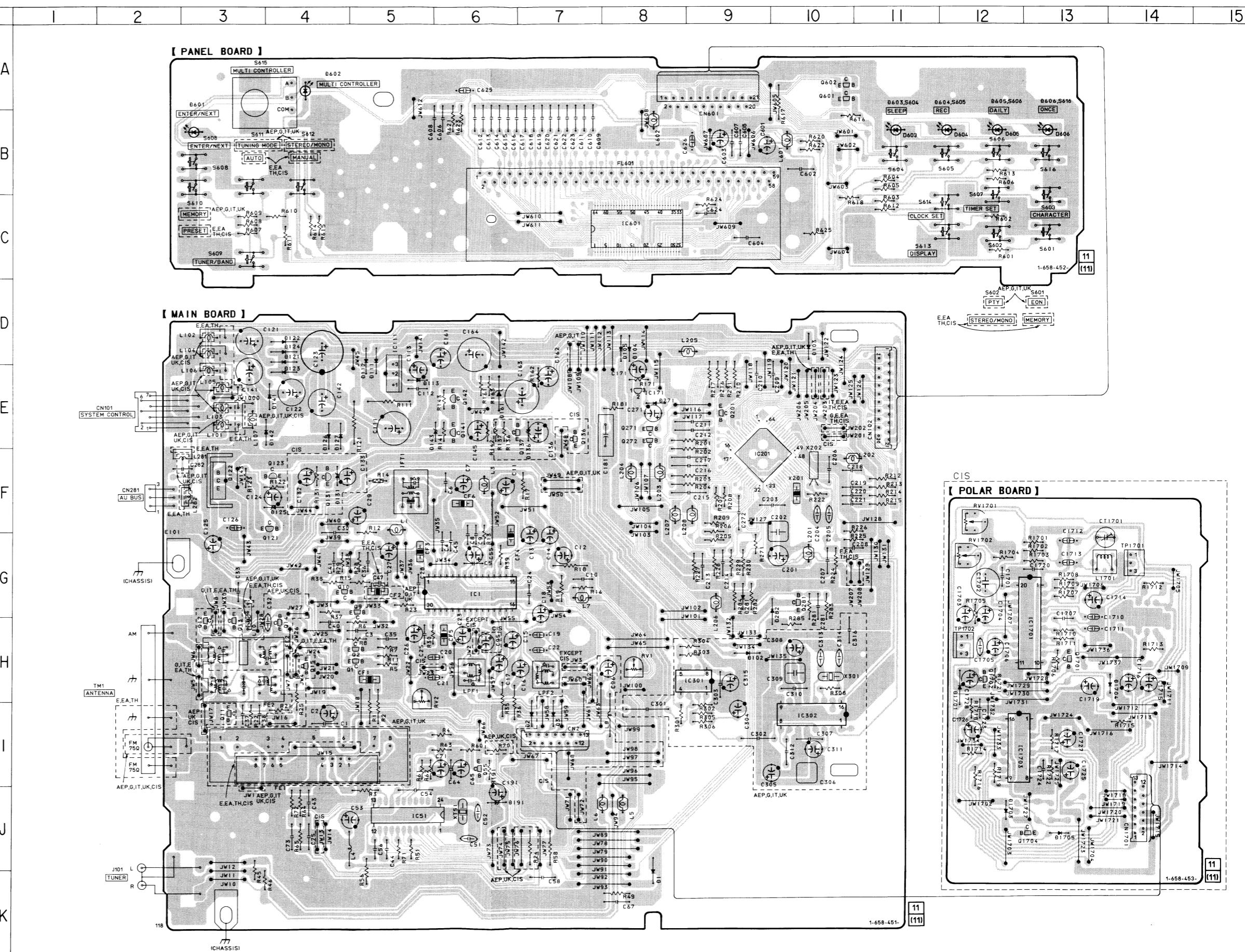
• Semiconductor Location

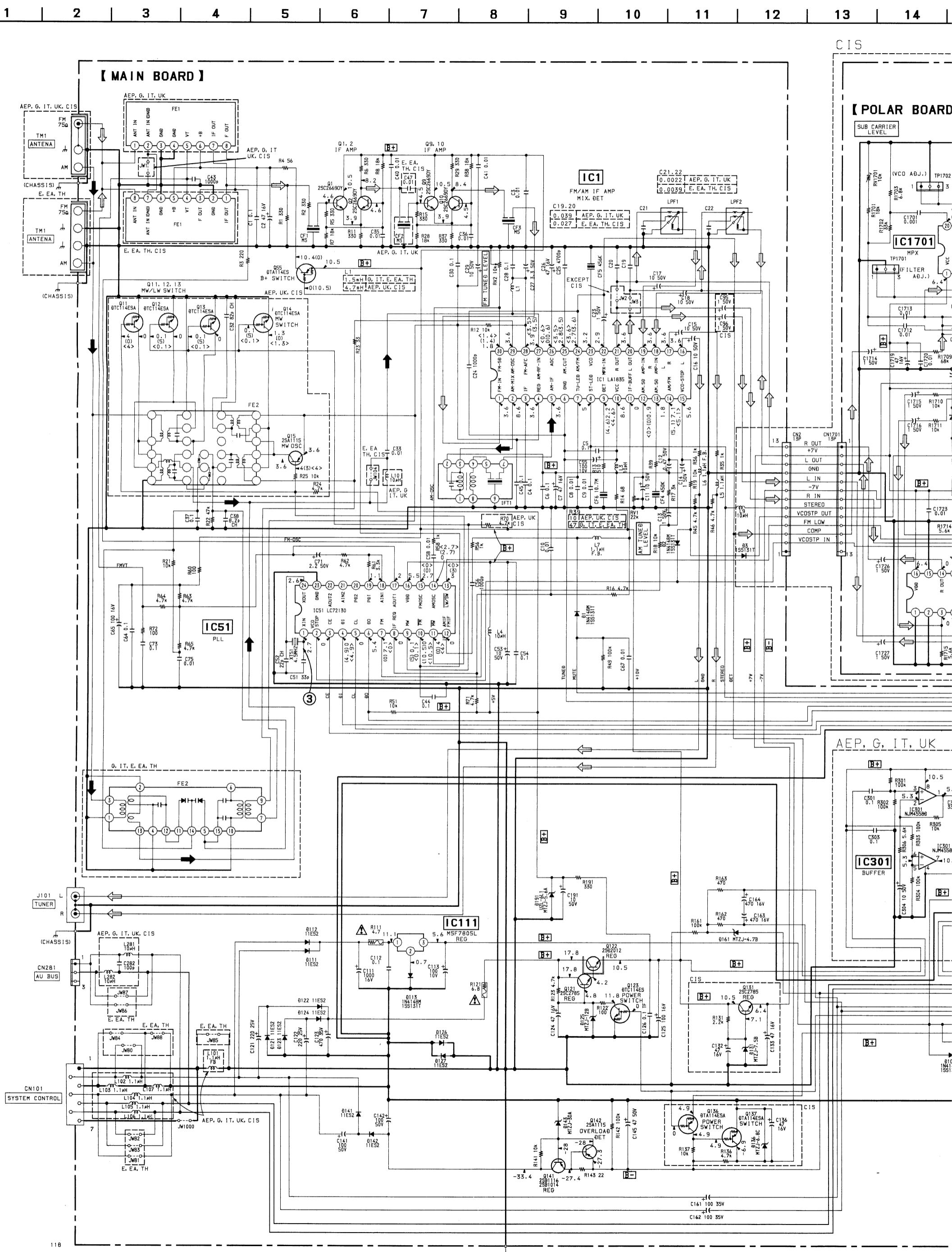
Ref. No.	Location	Ref. No.	Location
D1	K-8	IC1	G-6
D2	I-7	IC51	J-5
D3	I-7	IC111	E-5
D102	H-9	IC171	E-8
D103	D-10	IC201	F-9
D104	D-8	IC301	H-9
D105	D-8	IC302	I-10
D111	D-5	IC601	C-8
D112	D-5	IC1701	H-3
D113	E-5	IC1703	I-12
D121	E-4	Q1	H-5
D122	E-4	Q2	H-5
D123	E-4	Q9	G-5
D124	D-4	Q10	G-4
D125	F-4	Q11	I-3
D126	E-4	Q12	H-3
D127	E-4	Q13	H-3
D131	F-4	Q14	H-4
D141	E-4	Q15	H-4
D142	E-4	Q55	I-6
D143	E-6	Q121	F-4
D161	E-6	Q122	F-3
D191	J-6	Q123	F-4
D271	E-8	Q131	F-4
D281	G-9	Q136	E-7
D282	G-10	Q137	E-7
D601	B-3	Q141	E-6
D602	A-4	Q142	E-6
D603	B-11	Q201	E-9
D604	B-12	Q271	E-8
D605	B-12	Q272	E-8
D606	B-13	Q281	G-10
D1701	H-12	Q601	A-10
D1703	J-12	Q602	A-10
D1704	H-14	Q1701	H-13
D1705	J-13	Q1702	H-12
		Q1704	J-13

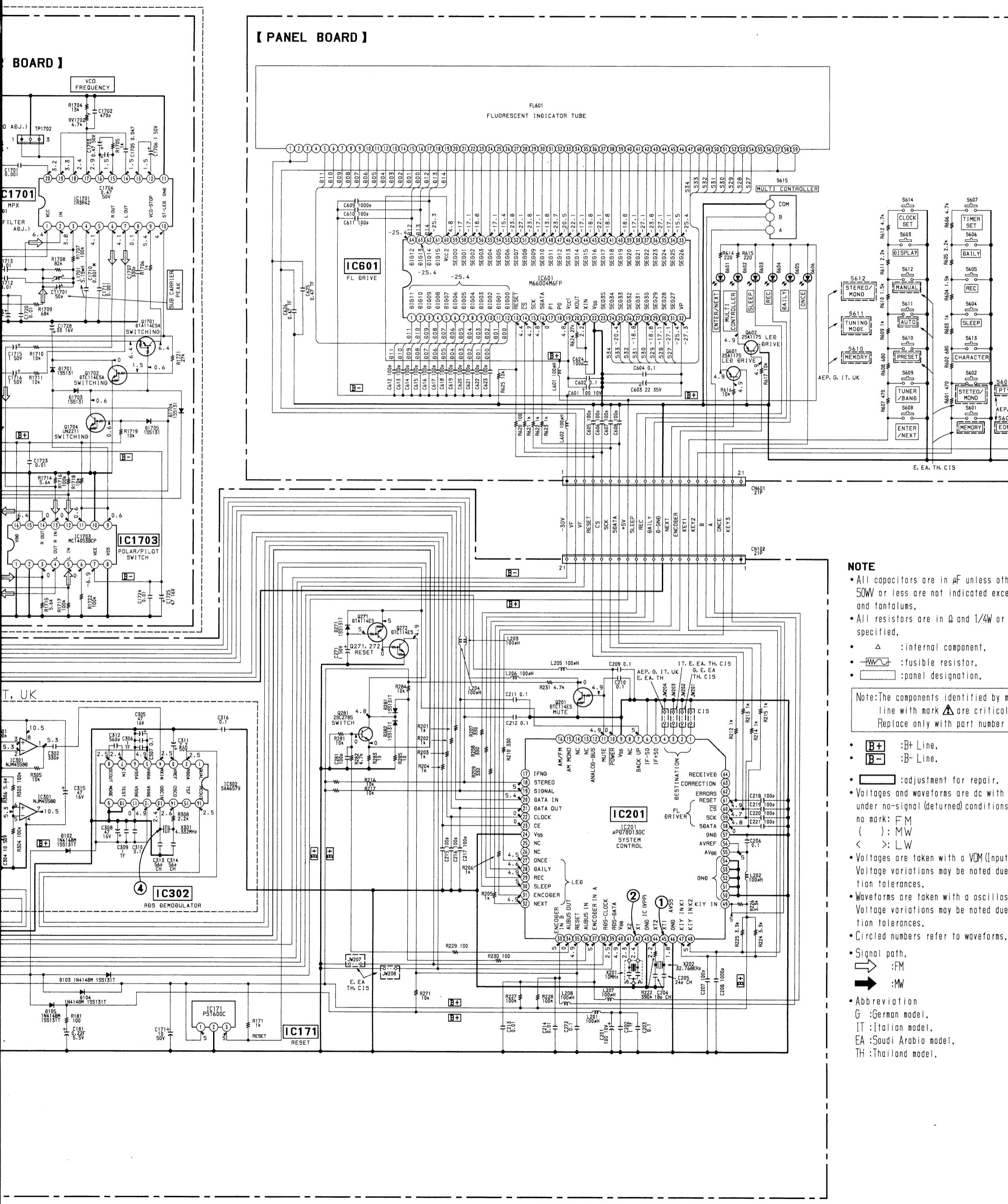
Note:

- : parts extracted from the component side.
- : parts extracted from the conductor side.
- △ : internal component.
- : Pattern from the side which enable seeing.

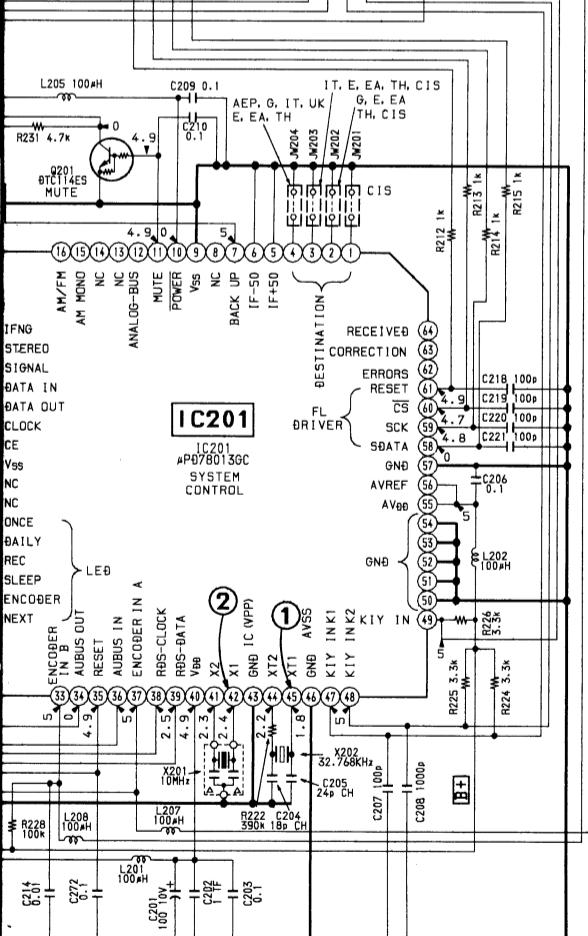
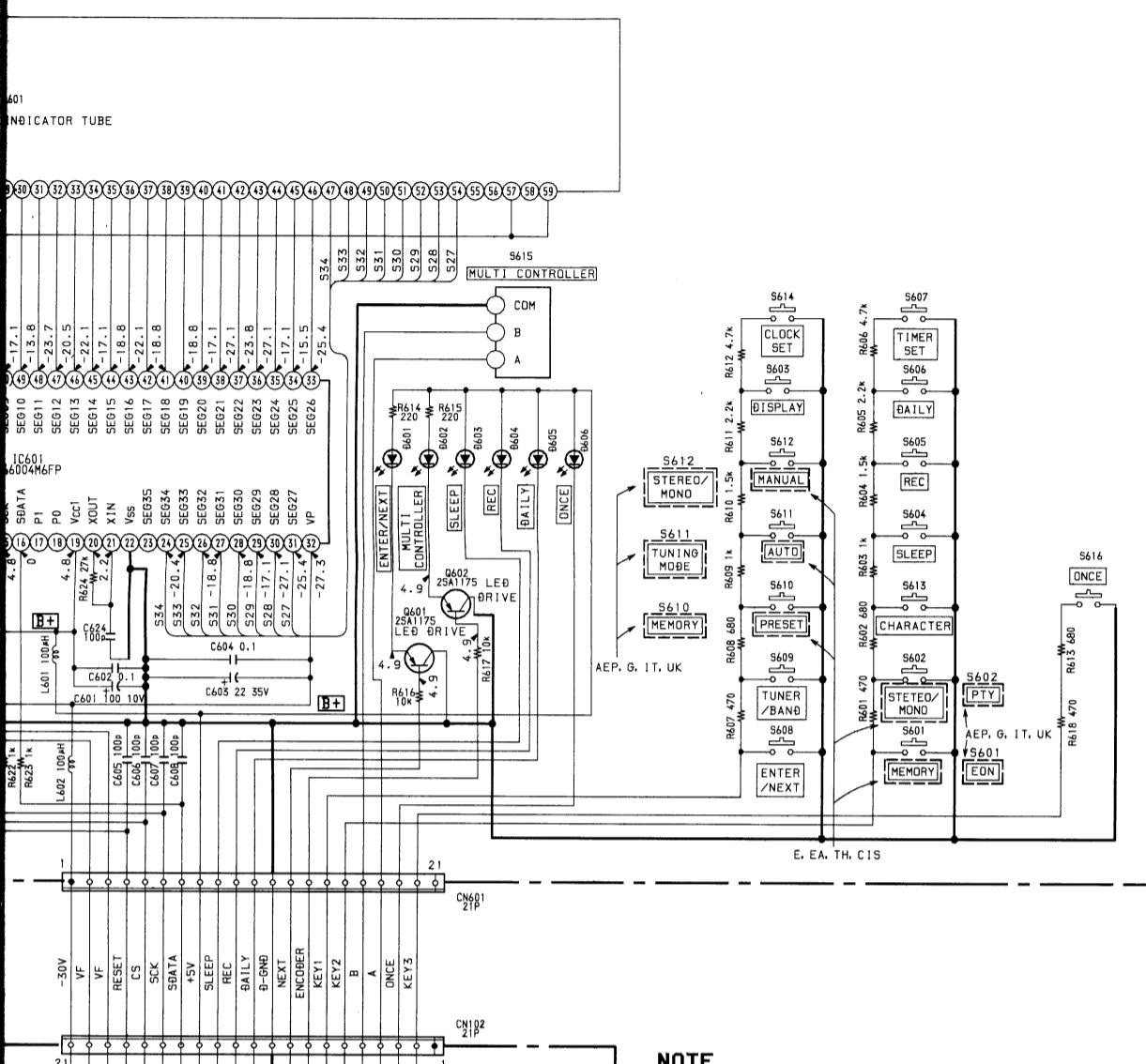
- Abbreviation
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- EA : Saudi Arabia model.
- TH : Thailand model.





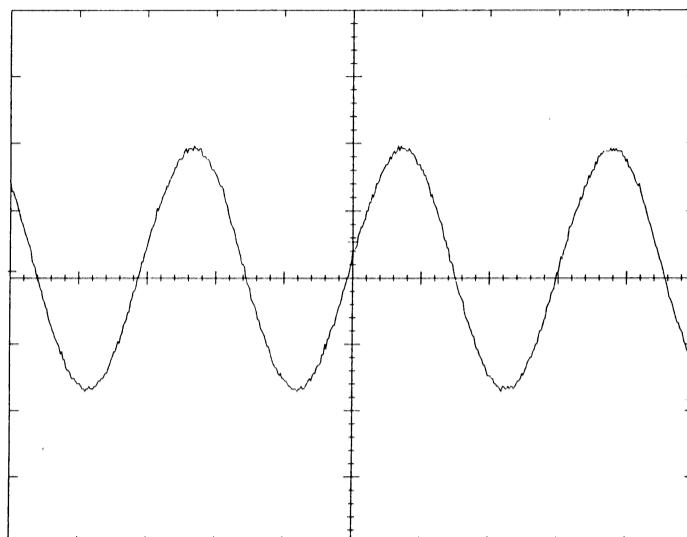


22 | 23 | 24 | 25 | 26 | 27 | 28 | 29

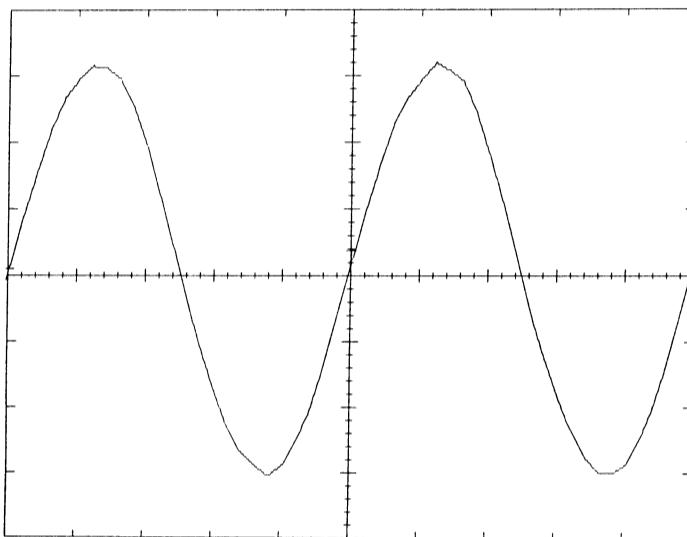


• Waveforms

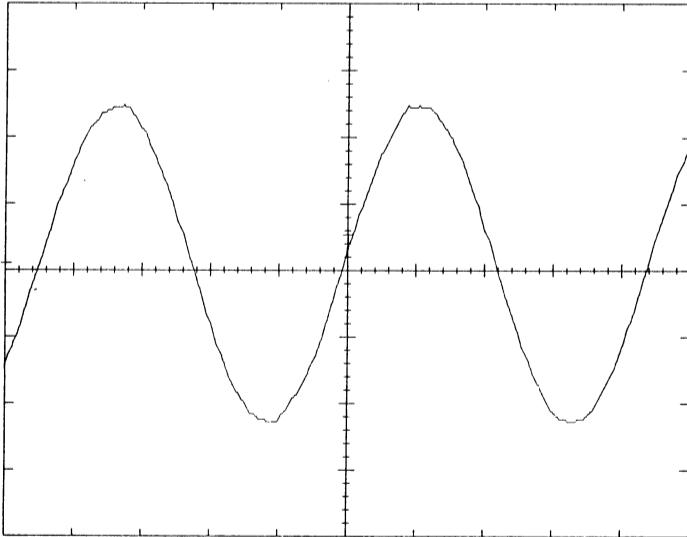
① IC201 ④ pin 1.8 Vp-p 32.768 kHz



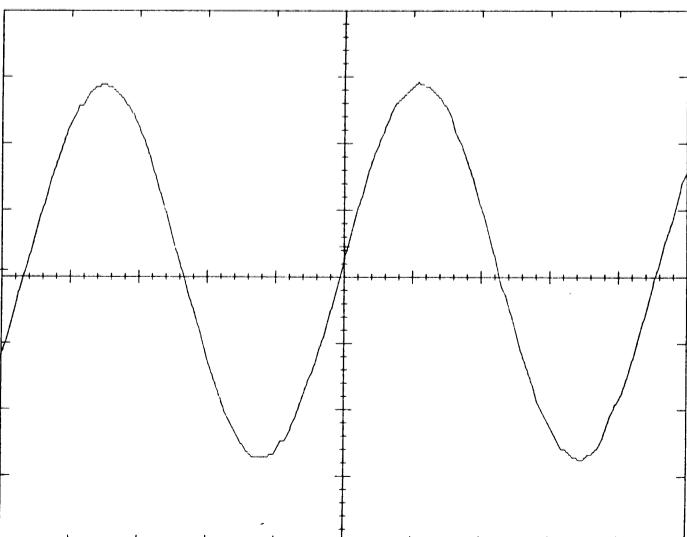
② IC201 ④ pin 3.1 Vp-p 10 MHz



③ IC51 ① pin 2.4 Vp-p 4.5 MHz



④ IC302 ⑬ pin 2.8 Vp-p 4.332 MHz



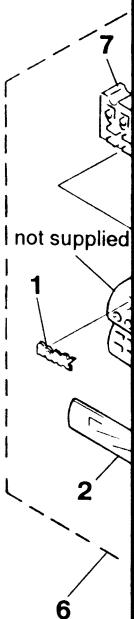
5-4. IC PIN FUNCTION

• IC201 SYSTEM CONTROL (μPD78013GC)

Pin No.	Pin Name	I/O	Function
1	DESTINATION	I	
2	DESTINATION	I	
3	DESTINATION	I	
4	DESTINATION	I	
5	IF +50	I	
6	IF -50	O	
7	BACK UP	I	Back up mode input.
8	NC	-	Not used. (open)
9	Vss	-	Ground
10	POWER	O	Power ON/OFF switch control.
11	MUTE	O	Mute output.
12	ANALOG BUS	-	
13	NC	-	
14	NC	-	
15	AM MONO	-	
16	AM/FM	-	
17	IFNG	-	
18	STEREO	I	STEREO signal input.
19	SIGNAL	I	TUNED signal input.
20	DATA IN	I	Data input. (LC72130, PLL)
21	DATA OUT	O	Data output. (LC72130, PLL)
22	CLOCK	O	Clock output. (LC72130, PLL)
23	CE	O	Chip Enable output. (LC72130, PLL)
24	Vss	-	Ground
25	NC	-	
26	NC	-	
27	ONCE	O	
28	DAILY	O	
29	REC	O	
30	SLEEP	O	
31	ENCODER	O	
32	NEXT	O	
33	ENCODER IN B	I	ENCODER input. (B)
34	AU BUS OUT	O	Audio bus output.
35	RESET	I	SYSTEM RESET input.
36	AU BUS IN	I	Audio bus input.
37	ENCODER IN A	I	ENCODER input. (A)
38	RDS-CLOCK	I	RDS clock input.
39	RDS-DATA	I	RDS data input.
40	VDD	-	Power supply 5V.

Pin No.	Pin Name	I/O	Function
41	X2	O	
42	X1	I	
43	GND	-	System main clock. (10 MHz)
44	XT2	O	Ground
45	XT1	I	System sub clock. (32.768 kHz)
46	GND	-	Ground
47	KEY IN K1	I	
48	KEY IN K2	I	
49	KEY IN	I	Key input. (analog)
50	GND	-	
51	GND	-	
52	GND	-	
53	GND	-	
54	GND	-	
55	AVDD	-	Ground
56	AVREF	-	Analog power supply +5V.
57	GND	-	Analog system reference voltage input.
58	SDATA	O	Fluorescent tube data output. (IC601)
59	SCK	O	Fluorescent tube clock output. (IC601)
60	CS	O	Fluorescent tube chip select signal output. (IC601)
61	RESET	O	Fluorescent tube reset signal output. (IC601)
62	ERRORS	I	
63	CORRECTION	O	Note used. (open)
64	RECEIVED	O	

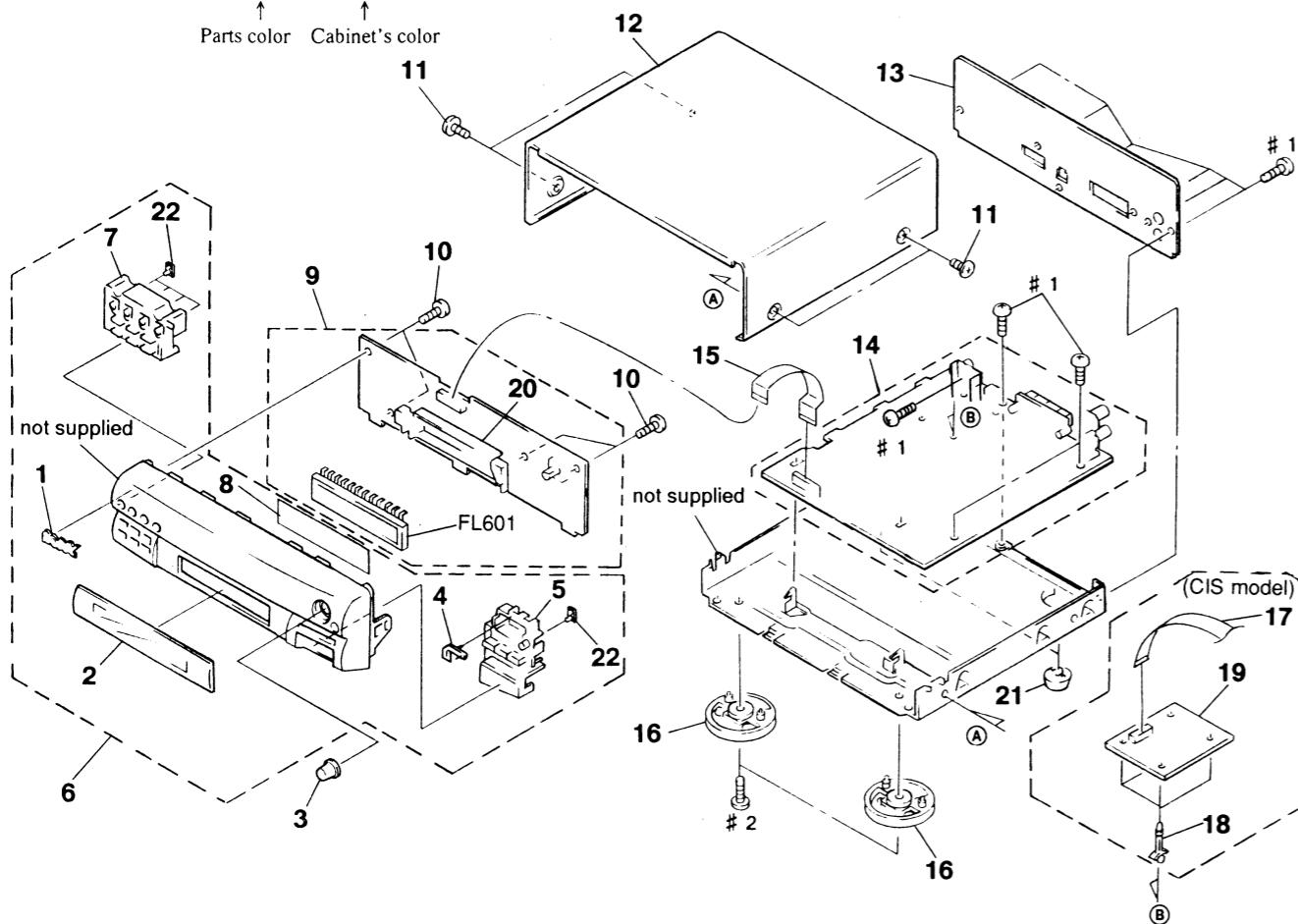
NOTE:
 • Items marked with * are seldom required.
 • Color Indication: KNOB, BA



Ref. No.	Part No.
1	4-9
2	X-4
2	X-4
3	4-9
3	4-9
4	4-9
5	4-9
5	4-9
5	4-9
6	X-4
7	4-9
7	4-9
8	4-9
* 9	A-4
* 9	A-4
10	4-9

SECTION 6 EXPLODED VIEW

- NOTE:**
- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
 - Color Indication of Appearance Parts Example:
KNOB, BALANCE (WHITE) ... (RED)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	4-962-708-11	EMBLEM (4-A), SONY		11	3-363-099-01	SCREW (CASE 3 TP2)	
2	X-4946-909-1	WINDOW (FL) ASSY (for SILVER)		* 12	4-970-927-21	CASE (BLACK)	
2	X-4946-912-1	WINDOW (FL) ASSY (for BLACK)		* 12	4-970-927-41	CASE (SILVER)	
3	4-977-680-11	KNOB (JOG) (GRAY)... (SILVER)		* 13	4-978-999-01	PANEL, BACK (E)	
3	4-977-680-21	KNOB (JOG) (BLACK)... (BLACK)		* 13	4-978-999-11	PANEL, BACK (Made in France)	(AEP, UK, G, IT, CIS)
4	4-977-705-11	INDICATOR (JOG)		* 13	4-978-999-21	PANEL, BACK (Made in Malaysia)(AEP, UK)	
5	4-977-704-11	BUTTON (BAND) (GRAY)... (SILVER)	(AEP, UK, G, IT)	* 13	4-978-999-31	PANEL, BACK (EA)	
5	4-977-704-21	BUTTON (BAND) (GRAY)... (SILVER)	(E, CIS, EA, TH)	* 13	4-978-999-41	PANEL, BACK (TH)	
5	4-977-704-31	BUTTON (BAND) (BLACK)... (BLACK)	(AEP, UK, G, IT)	* 14	A-4378-850-A	MAIN BOARD, COMPLETE (E, EA, TH)	
6	X-4946-594-1	PANEL ASSY (S), FRONT (SILVER) (E, EA)		* 14	A-4378-863-A	MAIN BOARD, COMPLETE (AEP, UK)	
6	X-4946-834-1	PANEL ASSY (BP), FRONT (BLACK)	(AEP, UK, G, IT)	* 14	A-4378-865-A	MAIN BOARD, COMPLETE (G)	
6	X-4946-956-1	PANEL ASSY (SP), FRONT (SILVER) (CIS, TH)		* 14	A-4389-478-A	MAIN BOARD, COMPLETE (IT)	
6	X-4946-965-1	PANEL ASSY (SP), FRONT (SILVER)	(AEP, UK, G, IT)	* 14	A-4389-479-A	MAIN BOARD, COMPLETE (CIS)	
7	4-977-703-11	BUTTON (TIMER) (GRAY)... (SILVER)	(AEP, UK, G, E, CIS, EA, TH)	18	4-924-098-91	HOLDER, PC BOARD (CIS)	
7	4-977-703-21	BUTTON (TIMER) (BLACK)... (BLACK)	(AEP, UK, G, IT)	* 19	A-4389-480-A	POLAR BOARD, COMPLETE (CIS)	
8	4-979-353-11	FILTER (MD)		* 20	4-979-798-01	HOLDER (FL)	
9	A-4378-851-A	PANEL BOARD, COMPLETE (E, EA, TH)		21	4-965-822-01	FOOT	
9	A-4378-864-A	PANEL BOARD, COMPLETE (AEP, UK, G, IT, CIS)		22	4-977-674-11	INDICATOR (ENTER)	
10	4-951-620-01	SCREW (2.6X8), +BVTP		FL601	1-517-368-11	INDICATOR TUBE, FLUORESCENT	

MAIN

NOTE:

The components identified by mark \triangle or dotted line with mark \triangle are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

SECTION 7 ELECTRICAL PARTS LIST

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- XX, -X mean standardized parts, so they may have some difference from the original one.

- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

RESISTORS

All resistors are in ohms
METAL: Metal-film resistor
METAL OXIDE: Metal Oxide-film resistor
F: nonflammable

SEMICONDUCTORS

In each case, u: μ , for example:
uA...: μ A..., uPA...: μ PA..., uPB...: μ PB...,
uPC...: μ PC..., uPD...: μ PD...

CAPACITORS

μ F : μ F

COILS

μ H : μ H

Abbreviation

G : German model
IT : Italian model
EA : Saudi Arabia model
TH : Thailand model

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*	A-4378-863-A	MAIN BOARD, COMPLETE (AEP, UK)	*****	C21	1-137-436-11	FILM	0.0039uF 5% 50V (E, EA, TH, CIS)
*	A-4378-850-A	MAIN BOARD, COMPLETE (E, EA, TH)	*****	C22	1-137-389-11	FILM	0.0022uF 5% 100V (AEP, G, IT, UK)
*	A-4378-865-A	MAIN BOARD, COMPLETE (G)	*****	C22	1-137-436-11	FILM	0.0039uF 5% 50V (E, EA, TH, CIS)
*	A-4389-478-A	MAIN BOARD, COMPLETE (IT)	*****	C23	1-124-903-11	ELECT	1uF 20% 50V
*	A-4389-479-A	MAIN BOARD, COMPLETE (CIS)	*****	C24	1-162-294-31	CERAMIC	0.001uF 10% 50V
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S		C25	1-162-600-11	CERAMIC	0.0047uF 30% 16V
			< CAPACITOR >	C26	1-126-967-11	ELECT	47uF 20% 16V
C1	1-164-159-21	CERAMIC	0.1uF 50V	C27	1-126-962-11	ELECT	3.3uF 20% 50V
C2	1-126-967-11	ELECT	47uF 20% 16V	C28	1-164-159-21	CERAMIC	0.1uF 50V
C3	1-162-306-11	CERAMIC	0.01uF 30% 16V	C29	1-126-964-11	ELECT	10uF 20% 50V
C4	1-164-159-21	CERAMIC	0.1uF 50V	C30	1-164-159-21	CERAMIC	0.1uF 50V
C5	1-164-159-21	CERAMIC	0.1uF 50V	C32	1-102-527-11	CERAMIC	82PF 5% 50V (AEP, UK, CIS)
C6	1-164-159-21	CERAMIC	0.1uF 50V	C33	1-162-306-11	CERAMIC	0.01uF 30% 16V
C7	1-126-967-11	ELECT	47uF 20% 16V	C35	1-162-306-11	CERAMIC	0.01uF 30% 16V
C8	1-162-306-11	CERAMIC	0.01uF 30% 16V	C36	1-162-306-11	CERAMIC	0.01uF 30% 16V
C9	1-162-306-11	CERAMIC	0.01uF 30% 16V	C37	1-164-159-21	CERAMIC	0.1uF 50V
C10	1-162-306-11	CERAMIC	0.01uF 30% 16V	C38	1-162-198-31	CERAMIC	8.2PF 10% 50V
C11	1-126-964-11	ELECT	10uF 20% 50V	C40	1-162-306-11	CERAMIC	0.01uF 30% 16V
C12	1-124-902-00	ELECT	0.47uF 20% 50V	C41	1-162-306-11	CERAMIC	0.01uF 30% 16V
C13	1-124-903-11	ELECT	1uF 20% 50V	C43	1-162-294-31	CERAMIC	0.001uF 10% 50V
C14	1-124-903-11	ELECT	1uF 20% 50V	C44	1-164-159-21	CERAMIC	0.1uF 50V
C15	1-126-964-11	ELECT	10uF 20% 50V	C45	1-164-159-21	CERAMIC	0.1uF 50V
C16	1-126-964-11	ELECT	10uF 20% 50V	C47	1-102-129-00	CERAMIC	0.01uF 10% 50V (E, EA, TH, CIS)
C17	1-126-964-11	ELECT	10uF 20% 50V	C51	1-102-518-11	CERAMIC	33PF 5% 50V
C18	1-126-964-11	ELECT	10uF 20% 50V	C52	1-102-959-00	CERAMIC	22PF 5% 50V
C19	1-136-160-00	FILM	0.039uF 5% 50V (AEP, G, IT, UK)	C53	1-126-964-11	ELECT	10uF 20% 50V
			(E, EA, TH, CIS)	C54	1-164-159-21	CERAMIC	0.1uF 50V
C19	1-136-158-00	FILM	0.027uF 5% 50V (E, EA, TH, CIS)	C55	1-126-933-11	ELECT	100uF 20% 10V
				C56	1-162-294-31	CERAMIC	0.001uF 10% 50V
				C58	1-162-306-11	CERAMIC	0.01uF 30% 16V
				C64	1-164-159-21	CERAMIC	0.1uF 50V
				C65	1-126-933-11	ELECT	100uF 20% 16V
				C67	1-162-306-11	CERAMIC	0.01uF 30% 16V
				C71	1-124-925-11	ELECT	2.2uF 20% 100V
				C73	1-164-159-21	CERAMIC	0.1uF 50V
				C75	1-162-306-11	CERAMIC	0.01uF 30% 16V
				C95	1-124-903-11	ELECT	1uF 20% 50V (CIS)

Ref. No.	Part No.	Description			Remark	Ref. No.	Part No.	Description		Remark
C96	1-124-903-11	ELECT	1uF	20%	50V (CIS)	C302	1-162-288-31	CERAMIC	330PF	10% 50V (AEP, G, IT, UK)
C111	1-126-952-11	ELECT	1000uF	20%	16V	C303	1-164-159-21	CERAMIC	0.1uF	50V (AEP, G, IT, UK)
C112	1-164-159-21	CERAMIC	0.1uF		50V	C304	1-126-964-11	ELECT	10uF	20% 50V (AEP, G, IT, UK)
C113	1-126-933-11	ELECT	100uF	20%	10V	C305	1-126-967-11	ELECT	47uF	20% 16V (AEP, G, IT, UK)
C121	1-104-666-11	ELECT	220uF	20%	25V	C306	1-136-177-00	FILM	1uF	5% 50V (AEP, G, IT, UK)
C122	1-104-666-11	ELECT	220uF	20%	25V	C307	1-164-159-21	CERAMIC	0.1uF	50V (AEP, G, IT, UK)
C123	1-126-951-11	ELECT	470uF	20%	35V	C308	1-126-967-11	ELECT	47uF	20% 16V (AEP, G, IT, UK)
C124	1-126-967-11	ELECT	47uF	20%	16V	C309	1-136-177-00	FILM	1uF	5% 50V (AEP, G, IT, UK)
C125	1-126-933-11	ELECT	100uF	20%	16V	C310	1-164-159-21	CERAMIC	0.1uF	50V (AEP, G, IT, UK)
C126	1-136-165-00	FILM	0.1uF	5%	50V	C311	1-124-925-11	ELECT	2.2uF	20% 100V (AEP, G, IT, UK)
C132	1-126-967-11	ELECT	47uF	20%	16V (CIS)	C312	1-162-291-31	CERAMIC	560PF	10% 50V (AEP, G, IT, UK)
C133	1-126-967-11	ELECT	47uF	20%	16V (CIS)	C313	1-101-884-00	CERAMIC	56PF	5% 50V (AEP, G, IT, UK)
C136	1-126-967-11	ELECT	47uF	20%	16V (CIS)	C314	1-101-884-00	CERAMIC	56PF	5% 50V (AEP, G, IT, UK)
C141	1-126-968-11	ELECT	100uF	20%	50V	C315	1-126-967-11	ELECT	47uF	20% 16V (AEP, G, IT, UK)
C142	1-126-968-11	ELECT	100uF	20%	50V	C316	1-164-159-21	CERAMIC	0.1uF	50V (AEP, G, IT, UK)
C145	1-126-967-11	ELECT	47uF	20%	50V					
C161	1-126-948-11	ELECT	100uF	20%	35V					
C162	1-126-948-11	ELECT	100uF	20%	35V					
C163	1-126-935-11	ELECT	470uF	20%	16V					
C164	1-126-935-11	ELECT	470uF	20%	16V					
C171	1-126-964-11	ELECT	10uF	20%	50V					
C181	1-125-705-11	CAPACITOR	0.22F	0	5.5V					
C191	1-126-964-11	ELECT	10uF	20%	50V					
C201	1-126-933-11	ELECT	100uF	20%	10V					
C202	1-136-177-00	FILM	1uF	5%	50V					
C203	1-164-159-21	CERAMIC	0.1uF		50V					
C204	1-102-953-00	CERAMIC	18PF	5%	50V					
C205	1-102-960-00	CERAMIC	24PF	5%	50V					
C206	1-164-159-21	CERAMIC	0.1uF		50V					
C207	1-162-282-31	CERAMIC	100PF	10%	50V					
										< FILTER >
C208	1-162-294-31	CERAMIC	0.001uF	10%	50V	CF1	1-579-374-71	FILTER, CERAMIC	CF1	(AEP, G, IT, UK)
C209	1-164-159-21	CERAMIC	0.1uF		50V	CF1	1-567-389-11	FILTER, CERAMIC	CF2	(E, EA, TH, CIS)
C210	1-164-159-21	CERAMIC	0.1uF		50V	CF2	1-760-393-11	FILTER, CERAMIC	CF3	(AEP, G, IT, UK)
C211	1-164-159-21	CERAMIC	0.1uF		50V	CF3	1-760-393-11	FILTER, CERAMIC	CF3	(AEP, G, IT, UK)
C212	1-164-159-21	CERAMIC	0.1uF		50V	CF3	1-567-389-11	FILTER, CERAMIC		(E, EA, TH, CIS)
C213	1-162-306-11	CERAMIC	0.01uF	30%	16V	CF4	1-527-981-00	FILTER, CERAMIC		
C214	1-162-306-11	CERAMIC	0.01uF	30%	16V	CF5	1-577-075-11	OSCILLATOR, CERAMIC		
C215	1-162-282-31	CERAMIC	100PF	10%	50V	CF6	1-760-220-11	FILTER, CERAMIC		
C216	1-162-282-31	CERAMIC	100PF	10%	50V					
C217	1-162-282-31	CERAMIC	100PF	10%	50V					
										< CONNECTOR >
C218	1-162-282-31	CERAMIC	100PF	10%	50V	* CN2	1-568-832-11	SOCKET, CONNECTOR 13P (CIS)		
C219	1-162-282-31	CERAMIC	100PF	10%	50V	CN101	1-770-158-21	HOUSING, CONNECTOR 7P (SYSTEM CONTROL)		
C220	1-162-282-31	CERAMIC	100PF	10%	50V	CN102	1-568-838-11	SOCKET, CONNECTOR 21P		
C221	1-162-282-31	CERAMIC	100PF	10%	50V	* CN281	1-565-561-11	PIN, CONNECTOR 3P (AU BUS)		
C271	1-124-903-11	ELECT	1uF	20%	50V					
										< DIODE >
C272	1-164-159-21	CERAMIC	0.1uF		50V	D1	8-719-815-85	DIODE	1S1585	
C281	1-162-282-31	CERAMIC	100PF	10%	50V	D2	8-719-815-85	DIODE	1S1585	
C282	1-162-282-31	CERAMIC	100PF	10%	50V	(AEP, G, IT, UK, CIS)	8-719-815-85	DIODE	1S1585 (CIS)	
C301	1-164-159-21	CERAMIC	0.1uF		50V	D102	8-719-815-85	DIODE	1S1585 (AEP, G, IT, UK)	
					(AEP, G, IT, UK)	D103	8-719-815-85	DIODE	1S1585	

MAIN

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
D104	8-719-815-85	DIODE	1S1585	L4	1-410-509-11	INDUCTOR	10uH
D105	8-719-815-85	DIODE	1S1585	L5	1-410-397-21	FERRITE BEAD INDUCTOR	
D111	8-719-200-82	DIODE	11ES2	L6	1-410-397-21	FERRITE BEAD INDUCTOR	
D112	8-719-200-82	DIODE	11ES2	L7	1-410-397-21	FERRITE BEAD INDUCTOR	
D113	8-719-815-85	DIODE	1S1585	L9	1-410-509-11	INDUCTOR	10uH (CIS)
D121	8-719-200-82	DIODE	11ES2	L10	1-414-183-41	INDUCTOR	10uH (AEP, G, IT, UK)
D122	8-719-200-82	DIODE	11ES2	L101	1-410-397-21	FERRITE BEAD INDUCTOR	(AEP, G, IT, UK, CIS)
D123	8-719-200-82	DIODE	11ES2	L102	1-410-397-21	FERRITE BEAD INDUCTOR	(AEP, G, IT, UK, CIS)
D124	8-719-200-82	DIODE	11ES2	L103	1-410-397-21	FERRITE BEAD INDUCTOR	(AEP, G, IT, UK, CIS)
D125	8-719-110-31	DIODE	RD12ES-B2	L104	1-410-397-21	FERRITE BEAD INDUCTOR	(AEP, G, IT, UK, CIS)
D126	8-719-200-82	DIODE	11ES2	L105	1-410-397-21	FERRITE BEAD INDUCTOR	(AEP, G, IT, UK, CIS)
D127	8-719-200-82	DIODE	11ES2	L106	1-410-397-21	FERRITE BEAD INDUCTOR	(AEP, G, IT, UK, CIS)
D131	8-719-921-63	DIODE	MTZJ-7.5B (CIS)	L107	1-410-397-21	FERRITE BEAD INDUCTOR	(AEP, G, IT, UK, CIS)
D136	8-719-109-97	DIODE	RD6.8ES-B2 (CIS)	L201	1-414-189-31	INDUCTOR	100uH
D141	8-719-200-82	DIODE	11ES2	L202	1-414-189-31	INDUCTOR	100uH
D142	8-719-200-82	DIODE	11ES2	L203	1-410-521-11	INDUCTOR	100uH
D143	8-719-982-19	DIODE	MTZJ-30A	L204	1-410-521-11	INDUCTOR	100uH
D161	8-719-010-34	DIODE	UZ-4.7BSC	L205	1-410-521-11	INDUCTOR	100uH
D191	8-719-109-88	DIODE	RD5.6ES-B1	L206	1-410-521-11	INDUCTOR	100uH
D271	8-719-815-85	DIODE	1S1585	L207	1-410-521-11	INDUCTOR	100uH
D281	8-719-815-85	DIODE	1S1585	L208	1-410-521-11	INDUCTOR	100uH
D282	8-719-815-85	DIODE	1S1585	L281	1-410-509-11	INDUCTOR	10uH (AEP, G, IT, UK, CIS)
< FRONTEND >				L282	1-410-509-11	INDUCTOR	10uH (AEP, G, IT, UK, CIS)
FE1	1-693-253-21	FRONT END (4 GANG)	(AEP, G, IT, UK)	< FILTER >			
FE1	1-693-090-51	FRONT END (FM)	(2 GANG) (E, EA, TH)	LPF1	1-239-597-11	FILTER, LOW PASS	
FE1	1-693-244-21	FRONT END (3 GANG)	(CIS)	LPF2	1-239-597-11	FILTER, LOW PASS	
FE2	1-233-514-11	ENCAPSULATED COMPONENT	(AEP, UK, CIS)	< TRANSISTOR >			
FE2	1-239-634-11	ENCAPSULATED COMPONENT, AM. RF	(G, IT, E, EA, TH)	Q1	8-729-230-99	TRANSISTOR	2SC2669-OY
< IC >				Q2	8-729-230-99	TRANSISTOR	2SC2669-OY
IC1	8-759-176-03	IC	LA1835	Q9	8-729-230-99	TRANSISTOR	2SC2669-OY
IC51	8-759-288-54	IC	LC72130	Q10	8-729-230-99	TRANSISTOR	2SC2669-OY
IC111	8-759-231-53	IC	TA7805S	Q11	8-729-029-67	TRANSISTOR	DTC114ESA-TP (AEP, UK, CIS)
IC171	8-759-165-80	IC	PST600C-T	Q12	8-729-029-67	TRANSISTOR	DTC114ESA-TP (AEP, UK, CIS)
IC201	8-759-338-81	IC	uPD78013GC-652-AB8	Q13	8-729-029-67	TRANSISTOR	DTC114ESA-TP (AEP, UK, CIS)
IC301	8-759-634-51	IC	M5218AP (AEP, G, IT, UK)	Q14	8-729-029-67	TRANSISTOR	DTC114ESA-TP (AEP, UK, CIS)
IC302	8-759-169-99	IC	SAA6579 (AEP, G, IT, UK)	Q15	8-729-119-76	TRANSISTOR	2SA1175-HFE (AEP, UK, CIS)
< IFT >				Q55	8-729-029-21	TRANSISTOR	DTA114ESA-TP
IFT1	1-409-636-11	TRANSFORMER, IF(CERAMIC FILTER)		Q121	8-729-119-78	TRANSISTOR	2SC2785-HFE
< JACK >				Q122	8-729-209-15	TRANSISTOR	2SD2012
J101	1-770-272-11	JACK, PIN 2P (TUNER)		Q123	8-729-029-67	TRANSISTOR	DTC114ESA-TP
< COIL >				Q131	8-729-119-78	TRANSISTOR	2SC2785-HFE (CIS)
L1	1-407-500-00	INDUCTOR	4.7mH (AEP, UK, CIS)	Q136	8-729-029-21	TRANSISTOR	DTA114ESA-TP (CIS)
L1	1-410-688-31	INDUCTOR	1.5mH (G, IT, E, EA, TH)	Q137	8-729-029-21	TRANSISTOR	DTA114ESA-TP (CIS)
L3	1-414-183-41	INDUCTOR	10uH	Q141	8-729-118-00	TRANSISTOR	2SB1116-L
				Q142	8-729-119-76	TRANSISTOR	2SA1175-HFE
				Q201	8-729-029-67	TRANSISTOR	DTC114ESA-TP
				Q271	8-729-029-21	TRANSISTOR	DTA114ESA-TP

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
Q272	8-729-029-67	TRANSISTOR	DTC114ESA-TP	R70	1-249-425-11	CARBON	4.7K 5% 1/4W
Q281	8-729-119-78	TRANSISTOR	2SC2785-HFE	R71	1-249-425-11	CARBON	4.7K 5% 1/4W
		< RESISTOR >		R72	1-247-807-31	CARBON	100 5% 1/4W
R1	1-249-411-11	CARBON	330 5% 1/4W	▲R111	1-217-641-00	FUSIBLE	4.7 5% 1/4W F
R2	1-249-411-11	CARBON	330 5% 1/4W	▲R121	1-217-642-81	FUSIBLE	6.8 5% 1/4W F
R3	1-247-815-91	CARBON	220 5% 1/4W	R122	1-247-807-31	CARBON	100 5% 1/4W
R4	1-249-402-11	CARBON	56 5% 1/4W	R123	1-249-425-11	CARBON	4.7K 5% 1/4W
R5	1-249-411-11	CARBON	330 5% 1/4W	R131	1-249-421-11	CARBON	2.2K 5% 1/4W (CIS)
R6	1-249-411-11	CARBON	330 5% 1/4W	R136	1-249-425-11	CARBON	4.7K 5% 1/4W (CIS)
R7	1-249-432-11	CARBON	18K 5% 1/4W	R137	1-249-429-11	CARBON	10K 5% 1/4W (CIS)
R8	1-249-432-11	CARBON	18K 5% 1/4W	R141	1-249-429-11	CARBON	10K 5% 1/4W
R11	1-249-411-11	CARBON	330 5% 1/4W	R142	1-249-441-11	CARBON	100K 5% 1/4W
R12	1-249-429-11	CARBON	10K 5% 1/4W	R143	1-247-791-91	CARBON	22 5% 1/4W
R13	1-249-442-11	CARBON	510 5% 1/4W	R161	1-249-441-11	CARBON	100K 5% 1/4W
R14	1-249-403-11	CARBON	68 5% 1/4W	R162	1-249-413-11	CARBON	470 5% 1/4W
R15	1-249-411-11	CARBON	330 5% 1/4W	R163	1-249-413-11	CARBON	470 5% 1/4W
R16	1-249-425-11	CARBON	4.7K 5% 1/4W	R171	1-249-417-11	CARBON	1K 5% 1/4W
R17	1-247-842-11	CARBON	3K 5% 1/4W	R181	1-247-807-31	CARBON	100 5% 1/4W
R18	1-249-429-11	CARBON	10K 5% 1/4W	R191	1-249-411-11	CARBON	330 5% 1/4W
R19	1-249-429-11	CARBON	10K 5% 1/4W	R201	1-249-417-11	CARBON	1K 5% 1/4W
R21	1-249-429-11	CARBON	10K 5% 1/4W	R202	1-249-417-11	CARBON	1K 5% 1/4W
R22	1-249-437-11	CARBON	47K 5% 1/4W	R203	1-249-417-11	CARBON	1K 5% 1/4W
R23	1-249-399-11	CARBON	33 5% 1/4W	R204	1-249-417-11	CARBON	1K 5% 1/4W
R24	1-249-425-11	CARBON	4.7K 5% 1/4W (AEP, UK, CIS)	R205	1-249-417-11	CARBON	1K 5% 1/4W
R25	1-249-429-11	CARBON	10K 5% 1/4W (AEP, UK, CIS)	R206	1-249-417-11	CARBON	1K 5% 1/4W
R28	1-249-432-11	CARBON	18K 5% 1/4W	R207	1-249-411-11	CARBON	330 5% 1/4W
R29	1-249-411-11	CARBON	330 5% 1/4W	R208	1-249-411-11	CARBON	330 5% 1/4W
R35	1-249-417-11	CARBON	1K 5% 1/4W	R209	1-249-411-11	CARBON	330 5% 1/4W
R36	1-249-417-11	CARBON	1K 5% 1/4W	R210	1-249-411-11	CARBON	330 5% 1/4W
R37	1-249-411-11	CARBON	330 5% 1/4W	R212	1-249-417-11	CARBON	1K 5% 1/4W
R38	1-249-432-11	CARBON	18K 5% 1/4W	R213	1-249-417-11	CARBON	1K 5% 1/4W
R39	1-249-393-11	CARBON	10 5% 1/4W (AEP, UK, CIS)	R214	1-249-417-11	CARBON	1K 5% 1/4W
R39	1-249-401-11	CARBON	47 5% 1/4W (G, IT, E, EA, TH)	R215	1-249-417-11	CARBON	1K 5% 1/4W
R45	1-249-425-11	CARBON	4.7K 5% 1/4W	R216	1-249-429-11	CARBON	10K 5% 1/4W
R46	1-249-425-11	CARBON	4.7K 5% 1/4W	R217	1-249-429-11	CARBON	10K 5% 1/4W
R49	1-249-441-11	CARBON	100K 5% 1/4W	R222	1-247-893-11	CARBON	390K 5% 1/4W
R51	1-249-429-11	CARBON	10K 5% 1/4W	R224	1-249-423-11	CARBON	3.3K 5% 1/4W
R56	1-249-417-11	CARBON	1K 5% 1/4W	R225	1-249-423-11	CARBON	3.3K 5% 1/4W
R58	1-249-417-11	CARBON	1K 5% 1/4W	R226	1-249-423-11	CARBON	3.3K 5% 1/4W
R60	1-249-405-11	CARBON	100 5% 1/4W	R227	1-249-441-11	CARBON	100K 5% 1/4W
R61	1-249-423-11	CARBON	3.3K 5% 1/4W	R228	1-249-441-11	CARBON	100K 5% 1/4W
R62	1-249-425-11	CARBON	4.7K 5% 1/4W	R229	1-247-807-31	CARBON	100 5% 1/4W
R63	1-249-425-11	CARBON	4.7K 5% 1/4W	R230	1-247-807-31	CARBON	100 5% 1/4W
R64	1-249-425-11	CARBON	4.7K 5% 1/4W	R231	1-249-425-11	CARBON	4.7K 5% 1/4W
R65	1-249-425-11	CARBON	4.7K 5% 1/4W	R271	1-249-429-11	CARBON	10K 5% 1/4W
				R281	1-249-429-11	CARBON	10K 5% 1/4W
				R282	1-249-425-11	CARBON	4.7K 5% 1/4W
				R283	1-249-393-11	CARBON	10 5% 1/4W
				R284	1-249-429-11	CARBON	10K 5% 1/4W

The components identified by mark ▲ or dotted line with mark ▲ are critical for safety.
Replace only with part number specified.

MAIN **PANEL**

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
R285	1-249-393-11	CARBON	10	5%	1/4W	C611	1-162-282-31	CERAMIC	100PF	10%	50V
R301	1-249-441-11	CARBON	100K	5%	1/4W (AEP, G, IT, UK)	C612	1-162-282-31	CERAMIC	100PF	10%	50V
R302	1-249-441-11	CARBON	100K	5%	1/4W (AEP, G, IT, UK)	C613	1-162-282-31	CERAMIC	100PF	10%	50V
R303	1-249-441-11	CARBON	100K	5%	1/4W (AEP, G, IT, UK)	C614	1-162-282-31	CERAMIC	100PF	10%	50V
R304	1-249-441-11	CARBON	100K	5%	1/4W (AEP, G, IT, UK)	C615	1-162-282-31	CERAMIC	100PF	10%	50V
R305	1-249-429-11	CARBON	10K	5%	1/4W (AEP, G, IT, UK)	C616	1-162-282-31	CERAMIC	100PF	10%	50V
R306	1-249-426-11	CARBON	5.6K	5%	1/4W (AEP, G, IT, UK)	C617	1-162-282-31	CERAMIC	100PF	10%	50V
R308	1-249-421-11	CARBON	2.2K	5%	1/4W (AEP, G, IT, UK)	C618	1-162-282-31	CERAMIC	100PF	10%	50V
						C619	1-162-282-31	CERAMIC	100PF	10%	50V
						C620	1-162-282-31	CERAMIC	100PF	10%	50V
						C621	1-162-282-31	CERAMIC	100PF	10%	50V
						C622	1-162-282-31	CERAMIC	100PF	10%	50V
						C623	1-162-282-31	CERAMIC	100PF	10%	50V
						C624	1-162-282-31	CERAMIC	100PF	10%	50V
						C625	1-136-173-00	FILM	0.47uF	5%	50V
						C626	1-136-173-00	FILM	0.47uF	5%	50V
< VARIABLE RESISTOR >						< CONNECTOR >					
RV1	1-238-601-11	RES, ADJ, CARBON 22K				* CN601	1-568-864-11	SOCKET, CONNECTOR 21P			
RV2	1-238-600-11	RES, ADJ, CARBON 10K				< DIODE >					
< TERMINAL >						D601	8-719-046-44	DIODE	SEL5221S (ENTER/NEXT)		
TM1	1-537-488-11	TERMINAL BOARD (ANTENNA)				D602	8-719-046-46	DIODE	SEL5221S-TH8F (MULTI CONTROLLER)		
TM1	1-537-238-21	TERMINAL BOARD (ANTENNA) (E, EA, TH)				D603	8-719-046-43	DIODE	SEL5421E-TP15 (SLEEP)		
< VIBRATOR >						D604	8-719-046-44	DIODE	SEL5221S (REC)		
X201	1-579-175-11	VIBRATOR, CERAMIC (10MHz)				D605	8-719-046-43	DIODE	SEL5421E-TP15 (DAILY)		
X202	1-567-098-41	VIBRATOR, CRYSTAL (32.768KHz)				D606	8-719-046-43	DIODE	SEL5421E-TP15 (ONCE)		
X301	1-579-900-21	VIBRATOR, CRYSTAL (4.332MHz)				< FLUORESCENT INDICATOR >					
XT51	1-760-549-11	VIBRATOR, CRYSTAL (4.5MHz)				FL601	1-517-368-11	INDICATOR TUBE, FLUORESCENT			
*****						< IC >					
*	A-4378-851-A	PANEL BOARD, COMPLETE (E, EA, TH)				IC601	8-759-261-63	IC	M66004M6FP		
*****						< COIL >					
*	A-4378-864-A	PANEL BOARD, COMPLETE (AEP, G, IT, UK, CIS)				L601	1-414-189-31	INDUCTOR	100uH		
*****						L602	1-414-189-31	INDUCTOR	100uH		
*	4-979-798-01	HOLDER (FL)				< TRANSISTOR >					
< CAPACITOR >						Q601	8-729-119-76	TRANSISTOR	2SA1175-HFE		
C601	1-126-933-11	ELECT	100uF	20%	10V	Q602	8-729-119-76	TRANSISTOR	2SA1175-HFE		
C602	1-164-159-21	CERAMIC	0.1uF		50V	< RESISTOR >					
C603	1-104-667-11	ELECT	22uF	20%	35V	R601	1-249-413-11	CARBON	470	5%	1/4W
C604	1-164-159-21	CERAMIC	0.1uF		50V	R602	1-249-415-11	CARBON	680	5%	1/4W
C605	1-162-282-31	CERAMIC	100PF	10%	50V	R603	1-249-417-11	CARBON	1K	5%	1/4W
C606	1-162-282-31	CERAMIC	100PF	10%	50V	R604	1-249-419-11	CARBON	1.5K	5%	1/4W
C607	1-162-282-31	CERAMIC	100PF	10%	50V	R605	1-249-421-11	CARBON	2.2K	5%	1/4W
C608	1-162-282-31	CERAMIC	100PF	10%	50V						
C609	1-162-294-31	CERAMIC	0.001uF	10%	50V						
C610	1-162-282-31	CERAMIC	100PF	10%	50V						

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark	
R606	1-249-425-11	CARBON	4.7K 5% 1/4W	C1704	1-124-902-00	ELECT	0.47uF 20%	
R607	1-249-413-11	CARBON	470 5% 1/4W	C1705	1-101-006-00	CERAMIC	0.047uF 50V (CIS)	
R608	1-249-415-11	CARBON	680 5% 1/4W	C1706	1-124-903-11	ELECT	1uF 20%	
R609	1-249-417-11	CARBON	1K 5% 1/4W	C1707	1-162-288-31	CERAMIC	330PF 10%	
R610	1-249-419-11	CARBON	1.5K 5% 1/4W	C1710	1-137-364-11	FILM	0.001uF 5%	
R611	1-249-421-11	CARBON	2.2K 5% 1/4W	C1711	1-137-364-11	FILM	0.001uF 5%	
R612	1-249-425-11	CARBON	4.7K 5% 1/4W	C1712	1-130-736-11	FILM	0.01uF 5%	
R613	1-249-415-11	CARBON	680 5% 1/4W	C1713	1-130-736-11	FILM	0.01uF 5%	
R614	1-247-815-91	CARBON	220 5% 1/4W	C1714	1-124-903-11	ELECT	1uF 20%	
R615	1-247-815-91	CARBON	220 5% 1/4W	C1715	1-124-903-11	ELECT	1uF 20%	
R616	1-249-429-11	CARBON	10K 5% 1/4W	C1716	1-124-903-11	ELECT	1uF 20%	
R617	1-249-429-11	CARBON	10K 5% 1/4W	C1719	1-126-967-11	ELECT	47uF 20%	
R618	1-249-413-11	CARBON	470 5% 1/4W	C1720	1-162-306-11	CERAMIC	0.01uF 30%	
R620	1-247-807-31	CARBON	100 5% 1/4W	C1723	1-162-306-11	CERAMIC	0.01uF 30%	
R621	1-249-417-11	CARBON	1K 5% 1/4W	C1724	1-162-306-11	CERAMIC	0.01uF 30%	
R622	1-249-417-11	CARBON	1K 5% 1/4W	C1725	1-126-967-11	ELECT	47uF 20%	
R623	1-249-417-11	CARBON	1K 5% 1/4W	C1726	1-124-903-11	ELECT	1uF 20%	
R624	1-249-434-11	CARBON	27K 5% 1/4W	C1727	1-124-903-11	ELECT	1uF 20%	
R625	1-249-429-11	CARBON	10K 5% 1/4W	C1728	1-126-966-11	ELECT	33uF 20%	
< SWITCH >								
< CONNECTOR >								
S601	1-554-303-21	SWITCH, TACTILE (AEP, G, IT, UK:EON) (E, EA, TH, CIS:MEMORY)		* CN1701 1-568-832-11 SOCKET, CONNECTOR 13P (CIS)				
S602	1-554-303-21	SWITCH, TACTILE (AEP, G, IT, UK:PTY) (E, EA, TH, CIS:STEREO/MONO)		< TRIMMER >				
S603	1-554-303-21	SWITCH, TACTILE (DISPLAY)		CT1701 1-141-260-00 CAP, TRIMMER 50PF (CIS)				
S604	1-554-303-21	SWITCH, TACTILE (SLEEP)		< DIODE >				
S605	1-554-303-21	SWITCH, TACTILE (REC)		D1701 8-719-815-85 DIODE 1S1585 (CIS)				
S606	1-554-303-21	SWITCH, TACTILE (DAILY)		D1703 8-719-815-85 DIODE 1S1585 (CIS)				
S607	1-554-303-21	SWITCH, TACTILE (TIMER SET)		D1704 8-719-815-85 DIODE 1S1585 (CIS)				
S608	1-554-303-21	SWITCH, TACTILE (ENTER/NEXT)		D1705 8-719-815-85 DIODE 1S1585 (CIS)				
S609	1-554-303-21	SWITCH, TACTILE (TUNER/BAND)		< IC >				
S610	1-554-303-21	SWITCH, TACTILE (AEP, G, IT, UK:MEMORY) (E, EA, TH, CIS:PRESET)		IC1701 8-759-063-04 IC IR3R42 (CIS)				
S611	1-554-303-21	SWITCH, TACTILE (E, EA, TH, CIS:AUTO) (AEP, G, IT, UK:TUNING MODE)		IC1703 8-759-140-53 IC uPD4053BC (CIS)				
S612	1-554-303-21	SWITCH, TACTILE (E, EA, TH, CIS:MANUAL) (AEP, G, IT, UK:STEREO/MONO)		< COIL >				
S613	1-554-303-21	SWITCH, TACTILE (CHARACTER)		L1701 1-409-497-11 COIL (FILTER) (CIS)				
S614	1-554-303-21	SWITCH, TACTILE (CLOCK SET)		< TRANSISTOR >				
S615	1-473-403-11	ENCODER, ROTARY (MULTI CONTROLLER)		Q1701 8-729-029-21 TRANSISTOR DTA114ESA-TP (CIS)				
S616	1-554-303-21	SWITCH, TACTILE (ONCE)		Q1702 8-729-029-67 TRANSISTOR DTC114ESA-TP (CIS)				

* A-4389-480-A POLAR BOARD, COMPLETE (CIS)								

< CAPACITOR >								
C1701	1-162-294-31	CERAMIC	0.001uF 10% 50V (CIS)	R1701	1-249-432-11	CARBON	18K 5% 1/4W (CIS)	
C1702	1-130-014-00	FILM	470PF 5% 50V (CIS)	R1702	1-249-435-11	CARBON	33K 5% 1/4W (CIS)	
C1703	1-124-902-00	ELECT	0.47uF 20% 50V (CIS)	R1703	1-249-427-11	CARBON	6.8K 5% 1/4W (CIS)	
				R1704	1-247-858-11	CARBON	13K 5% 1/4W (CIS)	

POLAR

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>		
R1705	1-249-417-11	CARBON	1K	5%	1/4W (CIS)
R1706	1-249-417-11	CARBON	1K	5%	1/4W (CIS)
R1707	1-249-441-11	CARBON	100K	5%	1/4W (CIS)
R1708	1-249-440-11	CARBON	82K	5%	1/4W (CIS)
R1709	1-249-439-11	CARBON	68K	5%	1/4W (CIS)
R1710	1-249-429-11	CARBON	10K	5%	1/4W (CIS)
R1711	1-249-429-11	CARBON	10K	5%	1/4W (CIS)
R1714	1-249-426-11	CARBON	5.6K	5%	1/4W (CIS)
R1715	1-249-426-11	CARBON	5.6K	5%	1/4W (CIS)
R1716	1-249-441-11	CARBON	100K	5%	1/4W (CIS)
R1717	1-249-441-11	CARBON	100K	5%	1/4W (CIS)
R1718	1-249-429-11	CARBON	10K	5%	1/4W (CIS)
R1719	1-249-429-11	CARBON	10K	5%	1/4W (CIS)
R1721	1-249-434-11	CARBON	27K	5%	1/4W (CIS)
R1722	1-249-441-11	CARBON	100K	5%	1/4W (CIS)

< VARIABLE RESISTOR >

RV1701 1-238-600-11 RES, ADJ, CARBON 10K (CIS)
 RV1702 1-238-599-11 RES, ADJ, CARBON 4.7K (CIS)

< TEST PIN >

* TP1701 1-560-061-00 PIN, CONNECTOR 3P (CIS)
 * TP1702 1-560-061-00 PIN, CONNECTOR 3P (CIS)

MISCELLANEOUS

15 1-773-144-11 WIRE (FLAT TYPE) (21 CORE)
 17 1-751-688-11 WIRE (FLAT TYPE) (13 CORE) (CIS)
 FL601 1-517-368-11 INDICATOR TUBE, FLUORESCENT

ACCESSORIES & PACKING MATERIALS

* 4-980-539-01 CUSHION (UPPER)
 * 4-980-540-01 CUSHION (LOWER)

 HARDWARE LIST

#1 7-685-646-79 SCREW +BVTP 3X8 TYPE2 N-S
 #2 7-685-647-79 SCREW +BVTP 3X10 TYPE2 N-S